

90 00484  
v. [2]

Draft  
Environmental Impact Report

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# Hamilton Field Master Plan and Redevelopment Plan

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Technical Background Documents to the Draft  
Environmental Impact Report

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Prepared by EIP Associates  
for  
**THE CITY OF NOVATO**

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July 1988

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90 00484  
v. [2]

**HAMILTON FIELD MASTER PLAN  
AND REDEVELOPMENT PLAN  
ENVIRONMENTAL IMPACT REPORT**

**TECHNICAL BACKGROUND DOCUMENTS**

**JULY 1988**

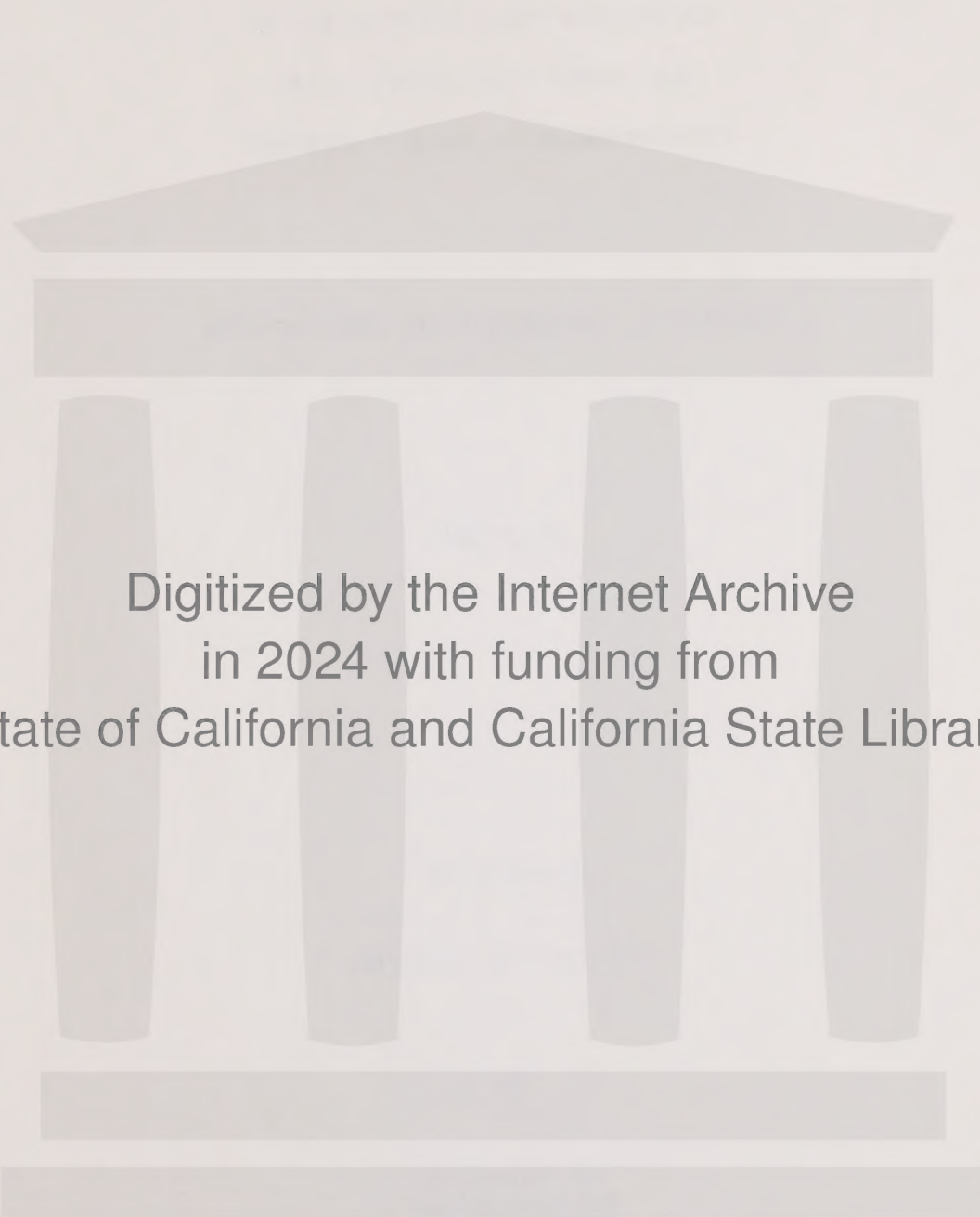
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RIGHT OF FIRST REFUSAL PROGRAM

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October 12, 1987

Ms. Natalie West  
City Attorney  
City of Novato  
Novato City Hall  
Novato, California

RE: Right of First Refusal to  
Residential Units at Hamilton Field

Dear Ms. West:

This office has been asked to present an updated legal opinion regarding Berg-Revoir Corporation's proposed program of providing a right of first refusal to rental and for-sale housing units at Hamilton Field to persons working at Hamilton and secondarily to persons working nearby to encourage a jobs/housing balance and to reduce long-distance commuting by Hamilton area employees. This opinion supercedes our previous opinion letter issued March 4, 1986 and includes updated information about the proposed right of first refusal program as described in the Revised Project Description for Hamilton Field dated September 1, 1987 and analysis of issues raised by other commentators and recent court decisions. The basic legal issue is whether this proposal could be found to be improperly discriminatory against persons seeking to occupy a rental unit or to purchase a for-sale unit at Hamilton who do not qualify for a right of first refusal under the proposed program.

Overview of Right of First Refusal Program

To support the jobs-housing management program, the project sponsor proposes that the availability of housing units at Hamilton will be structured so that employees at Hamilton would have a right of first refusal for an available rental or for-sale unit. A secondary right of first refusal would be given to persons who work within a 1.5 mile radius of the Nave Drive/State Access Road intersection, since such persons would have a short trip to work and would generally not need to commute on Highway 101. This zone would encompass workers in the military facilities at Hamilton and at companies across Highway 101 from Hamilton and in the Ignacio and Bel Marin Keys industrial parks and commercial areas. The long-term availability of the program for rental units would be ensured by a recorded covenant running with the land, and the for-sale unit program would apply to the first sale of a residential unit. The project sponsor is



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committed to the development of a workable and effective jobs-housing linkage program which will conform with applicable anti-discrimination laws and regulations. Further details of program implementation will be worked out at a later date.

Survey Review of Applicable Laws

In formulating our legal opinion, we have conducted a survey review of the pertinent Federal and California statutes, California Attorney General's Opinions, major case law, and commentaries. We found no statutory requirements or legal precedents addressed specifically to this type of housing priority program linked to employment and transportation, but a number of cases applying the general principles of fair housing law to analogous housing preference programs can be appropriately considered in evaluating this innovative proposal.

FEDERAL LAW

The pertinent Federal Laws are the Civil War-era civil rights laws and the Fair Housing Act of 1968. Withholding access to housing units because of racial factors is a clear violation of 42 U.S.C. Section 1982, but the applicability of this Civil War-era statute has been limited to racial discrimination.

The Fair Housing Act enacted in 1968 (Titles VIII and IX of the Civil Rights Act of 1968; 42 U.S.C. Sections 3601-3619 and 3631) prohibits discrimination in the sale and leasing of housing based upon race, color, religion, national origin or sex. Specifically 42 U.S.C. Section 3604 prohibits the refusal to sell or rent available dwelling units or to make them otherwise unavailable, discrimination in the terms and conditions for sale or rental, and advertising in terms of preference or limitation based upon race, color, religion, national origin or sex.

Our case survey found that most of the Fair Housing Act cases turn on the direct or indirect impact on racial minorities of various housing practices under court scrutiny. Federal Courts have found liability where race is only one of several factors. Green v. Century 21, 740 F. 2d 460 (1984). There is some divergence among the Federal Circuits about whether or not a showing of a racially discriminatory intention or motivation is necessary to prove a violation of the Fair Housing Act or whether a showing only that the action complained of had a de facto racially discriminatory effect is sufficient.

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The leading cases applying the de facto discriminatory effect rule under the Fair Housing Act are primarily official decisions by public entities. See Resident Advisory Bd. v. Rizzo, 564 F.2d 126 (1977) [Philadelphia public officials' decision not to build a public housing project was in effect racially discriminatory]; Metropolitan, Etc. v. Village of Arlington Heights, 558 F.2d 1283 (1977) [refusal to rezone property in suburban village near Chicago had racially discriminatory effect]; Arthur v. City of Toledo, Ohio, 782 F.2d 565 (6th Cir. 1986) [referendums on sewer extension ordinances for low income public housing projects did not have a racially discriminatory impact].

With respect to privately owned housing, a landlord or a cooperative apartment corporation may establish reasonable "financial and objective criteria" for applicants for units in conformance with the Fair Housing Act. Robinson v. 12 Lofts Realty, Inc., (1979) 610 F.2d 1032, 1039. A private landlord's decision to convert previously open market rental units to housing exclusively for university students was found not to be a violation of the Fair Housing Act, even though the existing tenants were predominantly minority persons and the university students were predominantly white. Dreher v. Rana Management, Inc., 493 F. Supp. 930 (1980). In Dreher, the Court noted that the University's rental policies for the student sub-tenants were non-discriminatory and that the percentage of minority persons in the University's student body was higher than the percentage of minority residents of the suburban town.

In Lee v. Minnock, 417 F. Supp. 436 (1976), the Court found: "We note that the Fair Housing Act does not include in its proscription discrimination upon the basis of occupation. Plaintiff's claim as to such discrimination cannot be addressed under this statute." (At 439).

In our opinion, the proposed right of first refusal program would not be in violation of applicable Federal laws. The proposal does not involve discrimination on the basis of race, color, religion, national origin, or sex. Further, there would probably not be a negative impact on racial minorities, even indirectly. Hamilton Field is planned to be a major regional employment center with approximately 7,500 jobs. These employment opportunities will be available to all persons on a non-discriminatory basis protected by applicable Civil Rights laws regarding employment. All employees of firms located at Hamilton



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Field would be entitled to the right of first refusal to the available housing units. Similar to the situation in Dreher above, it is probable that the proposed right of first refusal program at Hamilton would actually promote a diversity of persons in the housing units, including members of racial minorities, compared to the current composition of residents of Novato. Racial minorities working at other job sites located within the 1.5 miles radius from Hamilton would have an opportunity to live in available units at Hamilton Field through the secondary right of first refusal. The jobs/housing management program at Hamilton would be able to monitor the implementation of this program to insure that the program would not result in an unintentional de facto negative impact on the housing opportunities of racial minorities.

CALIFORNIA LAW

The pertinent California Laws are the Unruh Civil Rights Act, Civil Code Section 53, and the California Fair Employment and Housing Act. Because of the complexity of the issues, this section of our opinion letter presents first a summary of the pertinent statutory provisions and of leading and pertinent cases and then a statement of our conclusions about the applicability of State laws to the proposed housing priority program at Hamilton Field.

Unruh Civil Rights Act

The Unruh Civil Rights Act (California Civil Code Section 51) prohibits discrimination by a business establishment on grounds of sex, race, color, religious ancestry or national origin. Case law has held that an apartment complex is a "business establishment" covered by this Act. Swann v. Burkett (1962) 209 Cal. App.2d 685, Flowers v. John Burnham & Co. (1971) 21 Cal. App. 3d 700. A developer who builds housing for sale is a "business establishment" under this Act. Burks v. Poppy Construction Co. (1962) 57 Cal. 2d 463. A homeowners association for a common area project with CC&R's has been held to be a "business establishment" covered by this Act. O'Connor v. Village Green Owners Assn. (1983) 33 Cal. 3d 790.

The identification in the Unruh Civil Rights Act of particular bases of discrimination---sex, race, color, religious ancestry or national origin---has been held to be illustrative, rather than restrictive, and the California courts have determined that the Legislature intended to prohibit all arbitrary discrimination

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by business establishments. In re Cox (1970) 3 Cal. 3d 205, 216. A blanket exclusion from a rental housing complex of an entire class of people on the basis of a generalized prediction of misconduct (e.g., children) has been held to be discriminatory. Marina Point, Ltd. v. Wolfson (1982) 30 Cal. 3d 721. "Exclusion of persons based on a generalization about the class to which they belong is not permissible." O'Connor, at 794. It would be impermissible to exclude "members of entire occupations or avocations, e.g. sailors or motorcyclists" from places of public accommodation simply because the proprietors could show statistically that members of their occupation or avocation were more likely than others to be involved in a disturbance. Marina Point, at 739.

A restriction on the right of access to residential units is permissible if "rationally related to the facilities provided." In re Cox at 212; Newby v. Alto Riviera Apartments (1976) 60 Cal. App. 3d 288, 302. "Business establishments may lawfully establish reasonable regulations that are rationally related to the services performed and the facilities provided, so long as the restrictions are not arbitrary." 61 Attorney General's Opinions 320 (1978). With regard to discrimination in the rental or sale of real property because of a person's occupation, resolution of the question regarding its legality rests upon whether such discrimination would be considered arbitrary. 58 Attorney General's Opinions 608, 611 (1975). "The denial of housing accommodations because of one's occupation...may or may not be violative of the [Unruh Civil Rights] Act depending on whether any regulations denying such housing accommodations are reasonable and somehow rationally related to the services performed and the facilities provided. For example, an apartment complex could justifiably establish itself to serve elderly people, have special facilities and services for them, and design the complex for maximum quiet and restfulness. Under these circumstances, the denial of an apartment to people with several children would probably not be 'arbitrary' and thus not violative of the Act." Ibid., at 613.

Public policy reflected by legislative enactments can provide a legitimate basis for reserving housing units for special classes. Marina Point, at 742. Reservation of housing units for the elderly is justified as a "compelling societal interest," Marina Point, at 743. "Adults only" mobile home parks are explicitly authorized in the California Civil Code, (§§798.76, 799.5) because of "special features" in their design.

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Civil Code Section 53

This section is technically not part of the Unruh Civil Rights Act, but it is frequently combined with it. This section provides that a recorded restriction on real property cannot directly or indirectly limit the acquisition, use or occupation of such property because of the acquirer's, user's, or occupier's sex, race, religion, ancestry or national origin, and the Court can set aside an improper provision of recorded CC&R's.

In Taormina Theosophical Community, Inc. vs. Silver (1983), 140 Cal. App. 3d 964, the Court found that a recorded restriction limiting the right to purchase lots in a subdivision in Ojai to persons who were members of the Theosophical Society of America violated Civil Code Section 53. The court interpreted the scope of this section as "both broad and comprehensive," noting a "legislative desire to insure that no gaps in coverage exist," and that a "restrictive reading of the prohibited bases of discrimination would be at odds with the all-inclusive scope of its coverage." (at 975). The Court noted a "steady trend, both in the Legislature and in the Courts, to extend the prohibition afforded against discrimination on irrelevant criteria." (At 975). Although Theosophy is not a religion, it is concerned with spiritual rather than political or economic matters, so the recorded restriction was found to be an improper and irrelevant criterion for denying access to land. (At 976).

Recorded CC&R's restricting residents of a tract subdivision to persons aged 45 and over and fixing the maximum number of occupants per residence at three were held to be in violation of Civil Code Section 53 and the Unruh Civil Rights Act, and the City was criticized by the Court for creating and requiring the restrictions in return for a special use permit allowing smaller than standard lots. Park Redlands Covenant Control v. Simon (1986) 181 Cal. App. 3d 87.

California Fair Employment and Housing Act

The California Fair Employment and Housing Act (Government Code Sections 12900-12996; in part formerly called the Rumford Fair Housing Act) prohibits discrimination regarding housing accommodation against persons because of race, color, sex, marital status, national origin or age. Complaints filed with the Department of Fair Employment and Housing are investigated, and if warranted, are heard before the California Fair Employment and Housing Commission (FEHC). Decisions of the FEHC are issued as precedential and codified. Discrimination is established



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under the California Fair Employment and Housing Act if the Commission finds a causal connection between an adverse action in housing accommodation and discrimination under one of the specified categories. "The fundamental and unquestionable purpose of the FEH Act--evident from its every provision--is to eradicate arbitrary and unjustified discrimination wherever it appears." DEFH v. Carefree Ranch Mobile Home Park (1984) FEHC Dec. No. 84-31, at p. 15. The Commission has found violations under the Act where managers of apartment complexes or realty agents improperly withheld access to available housing units from persons because of unjustified criteria, for example, that black or racially mixed persons would not "fit in" in buildings or neighborhoods occupied totally or predominately by white persons. See DFEH v. Walnut Creek Manor (1987) FEHC Dec. No. 87-87; DFEH v. Davis Realty Co. (1987) FEHC Dec. No. 87-02.

A legitimate business interest may justify a preference program in renting units. Hess v. Fair Employment & Housing Com. (1982), 138 Cal. App. 3d 232, 236; DFEH v. Somekh (1980), FEHC Dec. 80-15, p. 7. Priority systems based on legitimate criteria are allowable if a unit is not presently available because of a priority commitment to another applicant, although it would be a violation of the Fair Employment and Housing Act to fail to consider a person for future openings. However, offering "a second priority" to an applicant which would be effective if the first priority applicant decides not to rent a unit is permissible under the FEH Act. DFEH v. Gwen-Bar, Inc. (1983) DFEH Dec. No. 83-18, p. 5.

Conclusions Regarding Applicability of State Laws.

- 1) In our opinion, the future operations of renting residential units and of selling for-sale units at Hamilton Field will be business establishments covered by the Unruh Civil Rights Act. Because the proposed Hamilton housing priority program will include a recorded restriction to insure the long-term effect of the program with respect to the rental units, Civil Code Section 53 is also applicable.
- 2) The proposed housing priority program for Hamilton will not involve discrimination on any of the bases stated specifically in the Unruh Civil Rights Act, Civil Code 53, or the California Fair Employment and Housing Act, namely, race, color, sex, religious ancestry or national origin.

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- 3) A critical question is whether or not a priority based on place of employment is an impermissible restriction on the right of access to residential units. In our opinion, persons who do not work at Hamilton or within a 1.5 mile radius of the central entry road would not comprise a group affiliation or class subject to arbitrary discrimination under the principles of In re Cox, Marina Point, O'Connor, Taormina, and Park Redlands. The reasoned conclusion that employees working at Hamilton Field or nearby who also live at Hamilton would tend to reduce commuter traffic on the overburdened regional highway is a reasonable justification for a housing priority program, and the priority system is "rationally related" to the housing facilities provided under the principles of In re Cox and Newby. The project sponsor has a "legitimate business interest" in terms of the principles in Hess and Somekh in promoting a jobs-housing balance and providing on-site housing available to on-site employees so that the Hamilton Field project build-out is not delayed or reduced because of off-site traffic impacts. In our opinion, the proposed priority system does not amount to arbitrary or unjustified discrimination restricting equal access to housing.
- 4) Preference criteria may potentially deny housing opportunities to persons who are not currently employed (e.g., retirees or persons receiving disability or welfare benefits). However, in the September, 1987 Revised Master Plan for Hamilton, 550 units at Hamilton are reserved as retirement rental units, of which 50 are BMR units, and a person on disability or welfare benefits may qualify for one of the 260 BMR non-retirement rental units or 40 BMR for-sale units at Hamilton Field.
- 5) An important factor in the evaluation of a proposed housing priority program is whether or not such a housing preference program is an implementation measure within the framework of adopted public policies. Unless the public policy directive is itself unjustifiably discriminatory as in Park Redlands, coherence with governmental objectives lends justification to a privately-developed program. The proposed right of first refusal program for Hamilton Field is an implementation measure purposefully directed toward meeting the public policy objectives for private development at Hamilton jointly adopted by the City of Novato and the County of Marin in 1979 and contained in the current Novato General Plan. For example: Regarding Office/Commercial development

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proposals for Hamilton, "[p]reference will be given to an applicant . . . who provides incentives for living on the site, rather than requiring in-commuting." [p.UE-28] Regarding Residential development at Hamilton, "[t]he types and sizes of units should be affordable by and appropriate for persons who work on the site. . . . Exclusive residential use of the site, without related job activities, would add to the present pattern of out-commuting and is not appropriate." [p.UE-28] Regarding Access and Circulation at Hamilton, "[t]he use of internal transportation methods other than autos, such as mini-buses and bicycle paths, is strongly encouraged. Reduction of the dependence on the automobile is a major intent of the Hamilton project." [p.UE-30] Amendments to the Novato General Plan currently under review would strengthen the public policy directives of linking on-site housing to on-site jobs at Hamilton. In our opinion, the proposed right of first refusal program is a reasonable attempt to implement adopted public policies.

- 6) When the details of implementing the right of first refusal program are worked out, measures can be incorporated to avoid challenges to the program under applicable state laws. For example, the program could include an affirmative marketing program to insure that members of groups that have traditionally experienced discrimination in housing will receive information about housing opportunities at Hamilton Field, and the overall development could provide a safety valve by holding some housing units out of the right of first refusal program, leaving them available on an equal access basis without application of the priority system. Our recommendations for the program are stated in the last section of this Opinion Letter.

UPDATED SURVEY OF OTHER JURISDICTIONS

Tiburon

In our initial March, 1986 Opinion Letter, we noted that the Town of Tiburon was in the process of developing a priority system for low/moderate income units in the Point Tiburon condominiums project, including a preference system for persons who were Town employees, employees of public service entities serving the Town, and local employees. The Town of Tiburon designed a point system that would also give special emphasis to length of residence in the Town of Tiburon or in Marin County. In August, 1986, the Town of Tiburon passed a resolution giving preference



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to qualified purchasers who are permanent employees of the Town or permanent employees of other public entities that are employed in the Town (school district, fire district, and sanitation districts) and setting aside 10 units in the Point Tiburon condominiums for such qualified persons. In October, 1986, the Town passed a Resolution allowing a second preference for persons over the age of 65 to purchase remaining units within the 10 reserved units if unsold to persons with the employment preference qualification.

However, since the initial structuring of this preference system, the Town of Tiburon has changed its position on the program. The developer of the Point Tiburon condominiums project presented the Town with a legal memorandum which concluded that the proposed point system could potentially violate the Unruh Civil Rights Act and the Federal Fair Housing Act. The memorandum stated in part: "[T]he emphasis on length of residence and employment in the Town and County and particularly in the County is suspect. Because of the demographics of the Town and the County, say 20 (or even 10) years ago, the probable effect of the point system is to a strong preference to whites, to the disadvantage of blacks, Asians, and other minorities. Although the point system may not be intentionally discriminatory, this effect makes possible a viable claim under the Unruh Act, which could be made against both the Town and the developer." The memorandum concluded: "From the foregoing, it should be clear that there is a great risk of litigation if the proposed point system is adopted. Because of the effect of the Unruh Act and the Fair Housing Act, the only acceptable criterion with respect to the allocation of the low/moderate income units is economic: Does the purchaser qualify under the definition of low or moderate income? Accordingly, the only safe ways to allocate the units is on a first-come, first-served basis (imagine the scene that would make!), or on a lottery for qualifying purchasers."

The Town Attorney agreed that the safest course for the Town of Tiburon and the developer was for the Town not to establish a housing priority system based on factors other than the financial eligibility of prospective purchasers. The Town Attorney also noted that a possible ground for challenging a housing priority system for Tiburon employees is that such a system would have an adverse impact on minorities, assuming they are under-represented in the work force of the Town. The Town of Tiburon has since rescinded all resolutions establishing preference criteria for the purchase of BMR units other than income eligibility.

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Corte Madera

The Town of Corte Madera was considering a preference program of BMR units in the Meadowcreek Station project whereby first priority would be given to employees of the Town of Corte Madera, second priority would be given to persons employed by other employers within the Town, and third priority would be given to elderly and handicapped persons. The Town Attorney has concluded that a preference system established by the Town for the sale of housing units would fall within the ambit of the Unruh Civil Rights Act. The Town Attorney advised the Corte Madera City Council that it is clear from the Park Redlands decision that the Town could not restrict occupancy to elderly persons, that a housing preference program favoring Town employees, absent a record demonstrating compelling reasons for the preference system, might violate the Unruh Act and the California Fair Employment and Housing Act, and that a preference system for all persons employed locally may be more difficult to defend than a preference system limited to Town employees. The Town of Corte Madera decided not to establish a housing priority program for the Meadowcreek Station project.

Mill Valley

For the Pickleweed project on Miller Avenue in Mill Valley, a joint development of the City of Mill Valley and BRIDGE Housing, the City established the following priority system for tenant selection for the Below Market Rate (BMR) units:

1. First priority shall be given to persons currently employed permanently, full-time by the City of Mill Valley and the Mill Valley School District.
2. Second priority shall be given to persons currently living within the city limits of Mill Valley.
3. Third priority shall be given to persons currently employed permanently, full-time within the city limits of Mill Valley.
4. Fourth priority shall be given to all other applicants.

This priority system was based directly upon housing policies and goals included in the City's General Plan. According to the Project Manager for BRIDGE, this consistency with



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adopted public policies validated the housing priority system when challenged by applicants who did not qualify under the higher priorities.

San Mateo

The City of San Mateo in April, 1987 developed a preference program for the Meadow Court condominiums, a BMR project developed by the Mid-Peninsula Coalition Housing Fund with financial assistance from the City. The priority system is as follows:

1. First Priority: Buyers (1) who have been residents of the City throughout the last three years, and (2) whose income is below 80% of the area median adjusted family size.
2. Second Priority: Buyers (1) who have been residents of the City throughout the last three years, or who have worked in the City throughout the last three years, and (2) whose income is below 90% of area median adjusted for family size.
3. Third Priority: Buyers (1) who have been residents of the City throughout the last three years, or who have worked in the City throughout the last three years, and (2) whose income is below 100% of area median adjusted or family size.
4. Fourth Priority: Buyers (1) who have not been residents in the City within the last three years, but (2) whose income is below 80% of area median adjusted for family size.
5. Fifth priority: Buyers (1) who have been residents of the City throughout the last three years, or who have worked in the City throughout the last three years, and (2) whose income is below 120% of area median adjusted for family size.
6. Sixth priority: Other buyers whose income is below 120% of area median adjusted for family size.
7. Seventh priority: All other buyers.

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Another feature of the Meadow Court program is an affirmative marketing plan designed to attract both minority and non-minority families, providing special outreach efforts to inform persons who would not normally be likely to apply because of existing neighborhood racial or ethnic patterns, price and/or other factors. In addition, the City required that all project advertising and signs will include prominent use of Equal Housing Opportunity logos, slogans and/or statements of intent to affirmatively market the units, that a fair housing poster will be displayed in the sales office, in the non-profit sponsor's office and in City Hall, and that the project brochure will describe pertinent data regarding the priority system and the method of buyer selection. In our survey, we learned that the City of San Mateo had referenced public policy objectives of reducing traffic problems and transportation-related air pollution as bases for the program and had specifically considered the potential issues of conformance with the Unruh Civil Rights Act and other pertinent State and Federal laws when establishing this priority system.

Sunnyvale

Since 1984, the City of Sunnyvale, has maintained a preference system for BMR units based heavily on place of employment as follows:

1. First Priority: Persons who have maintained their primary place of residence or employment within the City of Sunnyvale for two years or longer prior to the date of offer to purchase.
2. Second Priority: Persons who have maintained their primary place of employment within the City of Sunnyvale as of the date of offer to purchase.
3. Third Priority: All other persons.

The Sunnyvale Municipal Code which contains these criteria explains that the overall purpose of the BMR program is to contribute to the attainment of the housing goals set forth in the City's General Plan.

Los Gatos

The Town of Los Gatos has established a preference system for BMR units as follows:

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- 1) First Priority:
  - (a) Senior citizens who have lived in the Town for at least two years. A senior citizen is defined as any person 60 years of age or older, or married couples living together when at lease one spouse is 60 years of age or older.
  - (b) Salaried Town employees as defined in the Town's Personnel Rules, who have been employed by the Town for a period of no less that 12 months.
  - (c) Senior Citizens who have lived in the Town and have moved out of the Town within the previous five years at time of application.
- 2) Second Priority: Single heads of household with dependent children who have lived in the Town for at least two years.
- 3) Third Priority: Persons who live in the Town of Los Gatos and have lived in the Town for at least two years.
- 4) Fourth Priority: Persons who work in the Town of Los Gatos and have worked in the Town for at least two years.
- 5) Fifth Priority: All other applicants who live or work within Santa Clara County and are eligible according to family size and income criteria.

The high priority for Town employees is similar to the one recently rescinded by Tiburon. The general employment-related priority is in the fourth level, which means that the supply of available BMR units may be exhausted by applicants from higher priority categories. Our survey did not determine whether or not the employment-related criterion was at all connected to traffic impacts.

Conclusions from the Survey of Other Jurisdictions

The decisions of other local governments in the region about the legality of housing preference programs for BMR units present an analogous situation for our evaluation of the legality of the employment/transportation-related right of first refusal program proposed for Hamilton Field. The conclusions reached by various

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jurisdictions are mixed. While Tiburon and Corte Madera have decided that specific priority systems for BMR units present possible violations of the Unruh Civil Rights Act and perhaps other applicable laws, other jurisdictions have established priority systems for BMR units with a priority linked to place of employment (Mill Valley, San Mateo, Sunnyvale, and Los Gatos). These jurisdictions evidently have concluded that an employment-related housing priority program can be justified and defended under applicable State and Federal laws.

RECOMMENDATIONS FOR IMPLEMENTATION OF PROGRAM.

The project sponsor can incorporate into the housing management program certain safeguards suggested in some of the cases and housing priority programs surveyed to ensure non-discriminatory application of the right of first refusal program. We recommend that the following components be included in the program:

1. Applications Process: The program should take applications of all prospective renters or purchasers on an open and impartial basis. All prospective applicants should be fully advised of the procedures and criteria of the right of first refusal program. The waiting list should be clearly structured in terms of the priority categories, the type, size and cost of unit desired, and the range of dates desired for occupancy. When an application is completed, the applicant should be given a position on the waiting list within the appropriate priority category and for the desired type, size and cost of unit on a first come, first served basis. The applicant should be given an accurate statement of his position on the waiting list on the date of application and upon inquiry during the waiting period, if any. An applicant should be given fair notice and an opportunity to take units when available and for which the applicant qualifies in terms of economic criteria and verified place of employment, if pertinent, and also an opportunity to remain on the waiting list for a reasonable time if unable or unwilling to take a particular unit which comes available.

2. Reminders of Fair Housing and Equal Opportunity: The rental or sales programs should include in their classified or newspaper advertising, signs and brochures the fair housing logo and the words "equal opportunity." The Hamilton housing offices should prominently display the HUD equal housing opportunity poster and the Department of Fair Employment and Housing's fair housing



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poster. Staff of the Hamilton housing offices should receive some training in fair housing practices and procedures.

3. Affirmative Marketing: The project sponsor should work with housing agencies, non-profit housing organizations, and community organizations from throughout the region to insure that members of groups which traditionally have experienced housing discrimination and might not otherwise learn of housing opportunities at Hamilton will receive information about available housing units at Hamilton Field and have the opportunity to apply for such units on a first come, first served basis within the appropriate priority categories.

4. Non-Applicability to Some Units: The project sponsor should retain a portion of units outside the right of first refusal program which would be available on a first come, first served basis to all persons who qualify on economic criteria without other preference or priority. This portion of units would provide a safety valve so that non-employees of Hamilton or of nearby employers would have a reasonable chance of obtaining a unit at Hamilton Field for which they qualify on economic criteria.

5. Monitoring: To document that the right of first refusal priority system was applied and implemented in a fair and impartial way, the project sponsor should insure that the Hamilton housing offices keep lists of the names, addresses and telephone numbers of persons who inquire in person at the Hamilton housing offices about availability of units but do not complete applications, with notes indicating the race, color, and sex of such persons, as well as the disposition of the inquiries. The offices should also maintain lists of all applicants, with the name, address, telephone number of the applicants who complete applications, with notes indicating the race, color and sex of such persons, as well as the disposition of the application.

Examples of cases which outline remedial measures for housing practices found deficient in terms of applicable Federal and State laws are found in Davis v. Mansards (1984), 597 F. Supp. 334, 348-9 and DFEH v. Walnut Creek Manor (1987), FEHC Dec. No. 87-07, p. 26, Attachments A & B. The San Mateo BMR priority system includes affirmative marketing as a key component.



LAW OFFICES  
DANIEL F. REIDY

Ms. Natalie West  
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CONCLUSION

In summary of the above, it is our legal opinion that the proposed program of offering a right of first refusal to housing units at Hamilton Field first to employees of firms located at Hamilton Field and secondarily to persons working within a 1.5 mile radius of the central entry to Hamilton Field would not be in violation of applicable Federal or State civil rights or fair housing laws. The program does not involve discrimination on any of the bases specified in the applicable laws, and the proposed priority system is reasonable, non-arbitrary, justified by legitimate business interests, and responsive to public policy directives and a compelling general welfare interest for the region by promoting a jobs-housing balance and reducing off-site commuter traffic for this planned regional employment center. The inclusion into the program of our recommended measures would, in our opinion, assist in validating the program if challenged on grounds of being unjustifiably discriminatory.

Sincerely,

LAW OFFICES OF DANIEL F. REIDY,  
A Professional Corporation

  
By DANIEL F. REIDY

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OF COUNSEL  
THOMAS J. BERTRAND

REPLY TO

San Leandro

November 11, 1987

Daniel F. Reidy, Esq.  
A Professional Corporation  
515 Pacific Avenue, 3rd Floor  
San Francisco, CA 94133

Re: Hamilton Field Program: Right of First Refusal  
for Residential Units

Dear Mr. Reidy:

Thank you for forwarding to our office a draft of your revised legal opinion regarding Berg-Revoir's proposed right of first refusal program. We have reviewed your comprehensive opinion and are in agreement with its conclusion that the proposed program would not violate federal or state civil rights or fair housing laws.

The current proposed program appears responsive to potential legal concerns. One of the problems we anticipated might arise with the program as it was originally proposed, that of allowing the secondary right of refusal to persons working elsewhere in Novato, has been avoided by allowing the secondary right to persons who work within a 1.5 mile radius of the Nave Drive/State Access Road intersection. Also, the reservation in the revised Master Plan of retirement and BMR units addresses the concern about discrimination against persons who are not currently employed, an obvious concern with a program based on employment. There does not appear to be any basis on which one could challenge the revised program, on its face, because it does not arbitrarily discriminate against any specific group.

Daniel F. Reidy, Esq.

Re: Hamilton Field Program: Right of First Refusal  
for Residential Units

November 11, 1987

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As it can be difficult to guard against de facto discrimination, we agree with your suggestion and strongly recommend that a "safety valve" be built in whereby some housing units are held out of the right of first refusal program. We also encourage efforts toward affirmative and creative marketing techniques designed to reach all segments of the population, especially those that have traditionally experienced housing discrimination.

In summary, we concur in your conclusion that the revised proposed program meets applicable federal and state requirements. Thank you for your courtesy in sharing your draft opinion with our office.

Very truly yours,

MEYERS, NAVE, RIBACK & WEST

A handwritten signature in dark ink, appearing to read "Natalie E. West", is written over the typed name.

Natalie E. West  
City Attorney of Novato

NEW:dlg

CC: Mark Westfall  
City of Novato  
B. Howard/J. Revoir  
Berg-Revoir Corporation





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## EMPLOYMENT AND ORIGIN-DESTINATION ANALYSIS





**EMPLOYMENT AND ORIGIN-DESTINATION ANALYSIS**

**ON THE**

**REVISED**

**HAMILTON FIELD PROJECT**

Proposed by Berg-Revoir, Corp.

Prepared for the City of Novato

June, 1988

Prepared by

EIP Associates  
150 Spear Street, Suite 1500  
San Francisco, CA 94105  
(415) 546-0600

Russell Faure-Brac, Principal in Charge  
Ted Adams, Project Manager  
Doug Svensson, Planner/Economist

APPLIED DEVELOPMENT ECONOMICS  
Stephen Wahlstrom, Principal



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## EXECUTIVE SUMMARY

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This appendix analyzes the employment characteristics and the residential location of the workforce of the revised application for development at Hamilton Field, submitted to the City of Novato September 1, 1987. The 1985 version of this appendix also analyzed the market support for the project; however, the market analysis for the current project is contained in a separate report by Lynn Sedway & Associates dated November 1987. The following table summarizes the methodology and main conclusions of the analysis in this appendix. It also references the tables in the body of the report that contain the pertinent data for each step in the analysis. A similar analysis is conducted for three alternatives to the project.

### SUMMARY OF STUDY METHODOLOGY AND RESULTS

<u>Step in the Analysis</u>	<u>Data Source</u>	<u>Result</u>
1. Determine market support for the project.	Market Study by Lynn Sedway & Associates (separate report)	Full buildout of proposed project by 2000.
2. Calculate on-site employment.	Employment density factors (see Table 2).	7,300 jobs (7,170 net new jobs)
3. Determine type of workers.	Estimate occupational distribution by land use type (see Tables 4 and 5)	36% Professional, Managerial, Technical 35% Clerical, Sales 14% Production 15% Others
4. Identify existing travel patterns to jobs in Novato.	Employer Survey by ADE (see Table 13).	26% from Novato 41% from northern counties 27% from South Marin/San Francisco 6% from East Bay

<u>Step in the Analysis</u>	<u>Data Source</u>	<u>Result</u>
5. Analyze housing market to determine if commute patterns for project workers will differ from existing pattern.		
5a. Estimate workers' household incomes.	Resident Survey by ADE (see Tables 10 & 11).	Less than: \$22,000 17.7% \$22,000-\$44,000 49.0% \$44,000-\$66,000 17.9% More than: \$66,000 15.4%
5b. Compare incomes with current housing costs.	Housing costs based on 1980 census inflated by NCRRC index.	Workers could afford housing at current prices in each market area.
5c. Analyze projected growth in housing.	ABAG projections of housing and employment.	The latest projections show more housing built in South Marin and less in Novato than the previous projections.
6. Determine proportion of Marin workers (46% of the total workforce) who would live on-site.	See Section 3.4	
6a. Calculate reasonable range of workers residing on-site.		
High end of range:		Assume 40% of workers living in Marin wish to rent and the other 60% wish to own their homes (based on 1980 Census). If 100% live on-site, this equals 1,291 workers (17.7% of the total workforce) occupying 1,005 units.
Low end of range:	See Section 3.4	If the 1,291 workers occupy units on-site and elsewhere in Marin in proportion to projected housing growth, 547 workers would occupy 436 rental units on-site.



<u>Step in the Analysis</u>	<u>Data Source</u>	<u>Result</u>
6b. Select reasonable case.	See Section 3.4	Because of the right of first refusal and the BMR program, the average of the above range would be a reasonable, worst-case projection of workers living on-site.
6c. Repeat analysis for ownership housing.	See Section 3.4	<p>The range of workers in these units would be 108 to 560, with the midpoint at 334 workers occupying 239 units.</p> <p>1,229 workers (16.8% of the workforce) would occupy 951 units on-site. Of these units occupied by workers, 28 would be in the senior units. Overall, workers would occupy 30.8% of the 3,000 non-senior units and 27.8% of the 3,550 total units on-site.</p>
7. Determine commute patterns of non-project workers occupying on-site housing.	Resident Survey by ADE (see Section 3.5).	<p>29% (841 employees) work in Novato</p> <p>3% (87 employees) work north of Novato</p> <p>68% (1,972 employees) work south of Novato</p>

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## EMPLOYMENT AND ORIGIN-DESTINATION ANALYSIS

---

### 1. INTRODUCTION

The following analysis summarizes the market support for development at Hamilton Field, projects the employment on-site at full buildout, and estimates the residential location of the workforce.

A major purpose of this report is to provide input to the transportation analysis for the EIR on the Hamilton Field project. Although the discussion covers transportation-related data obtained from surveys conducted for the study, no analysis of transportation impacts of the project has been done in this report.

The City of Novato and Marin County are requested to review this material and provide comments that can be incorporated into the transportation analysis as it is being prepared.

In addition to standard sources of economic and demographic data such as the 1980 Census and Projections '87 published by ABAG, the discussion relies on data from several surveys conducted by EIP Associates and Applied Development Economics, Inc. (ADE). The first of these surveys questioned a sample of 110 firms in Marin, Sonoma, Napa and East Bay Counties. The sample was selected to represent the types of firms likely to locate at Hamilton Field. The 110 firms sampled employ more than 10,000 employees. The second survey sampled 350 households in Marin and Sonoma Counties and gained journey-to-work and labor market information on more than 600 people. The sample for this survey was designed to constitute a representative sample of occupational and income groups, as well as an even geographic distribution within the Highway 101 corridor from Sausalito to Santa Rosa.

TABLE 1  
HAMILTON FIELD

DIRECT EMPLOYMENT GENERATION

LAND USE	BUILDING SQUARE FEET	EMPLOYMENT DENSITY*	NUMBER OF EMPLOYEES
Office			
New	690,000	270 (a)	2,556
Rehab	0	270 (a)	0
Medical Research	440,000	523 (b)	841
Other Research	300,000	523 (b)	574
Industrial	300,000	430 (a)	698
Warehousing	300,000	767 (b)	391
Retail	250,000	555 (b)	450
Hotel	200,000		
	200 rooms	0.8 (c)	160
Hospital	120,000	370 (f)	319
Nursing/Treatment	240,000	278 (d)	863
Medical Offices	60,000	278 (d)	216
Project Wide Services		12,500 (e)	232
TOTAL	2,900,000		7,300
Not including existing hospital employees:			7,170

\* The employment density factor is the number of square feet of building space per employee.

- (a) Applied Development Economics, Inc.,  
Employer Survey: Marin County services sector.
- (b) Gruen Gruen + Associates. Employment Densities  
By Type of Workplace. July, 1985. page 41.
- (c) Recht Hausrath & Associates. Future Hotel Rooms  
Demand Study for the City of Monterey. March 1985.
- (d) EIP Associates. Stanford Hospital Modernization  
Project EA. April, 1984.
- (e) Recht Hausrath & Associates. Downtown Consultant's  
Report, 1983, Appendix H.
- (f) 130 employees in 50,000 sq ft are existing in Novato.  
Joel Grey, Sutter Community Hospital, telephone  
conversation, December 30, 1987.

Detailed descriptions of the methodologies and results from the surveys may be obtained from EIP Associates.

## **2. EMPLOYMENT ANALYSIS**

### **2.1 NUMBER OF EMPLOYEES**

Total on-site employment for the Hamilton Field project is projected at 7,300 workers. Table 1 presents the employment estimates for each land use type in the project and indicates the sources of the factors used.

EIP has employed a variety of data sources to estimate employment in the project. The employer survey conducted by ADE, Inc. indicates existing employment densities for a selected group of business types in Marin County, Sonoma County, and portions of Solano and Contra Costa Counties. However, broader surveys of employment densities have also been used inasmuch as the Hamilton Project is intended to accommodate a range of firms not necessarily prevalent currently in the North Bay area. In addition to the ADE survey, Gruen Gruen + Associates has conducted a review of numerous studies throughout the Bay Area regarding employment densities. The conclusions of that review are shown in Table 2. EIP has used other sources of data for certain of the land uses not included in these studies.

Office space employment is based on the service sector firms sampled from Marin County in the employer survey. The figure of 270 sq ft per employee is lower than the comparable figure in the GG+A study, yet similar to office space employment densities in San Francisco. The trend in the Bay Area in recent times has been toward a larger amount of office space per employee, more in keeping with the GG+A figure. However, on the basis of the market study discussed above, we believe the Marin County figure should be used in this analysis.

The GG+A study specifically identifies employment density factors for research space, whereas this sector is not separated out of the data from the ADE employer survey. The average factor is 523 sq. ft. per employee.



TABLE 2

Adjusted Ranges (Excluding Outliers)  
and Midpoints of Employment Densities  
(Square Feet Per Employee)

---

<u>Workplace Type</u>	<u>Adjusted Range of Employment Densities</u>	<u>Midpoint of Adjusted Range</u>
Office*	264 - 325	295
Research & Development*	349 - 697	523
Light Manufacturing	433 - 591	512
Warehouse/Service Industrial	586 - 947	767
Service Commercial	487 - 581	534
Retail	510 - 600	555
Restaurant*	137 - 173	155
Hotel/Motel*	908 - 1,062	985

\*Ranges for these workplace types have not been adjusted, because the data were reasonably consistent across data sources.

Source: Gruen Gruen + Associates, Employment Densities  
By Type of Workplace. July. 1985.

TABLE 3  
OCCUPATIONAL DISTRIBUTION

LAND USE =====	Professional, Managerial, Technical =====	Clerical, Admin., Sales =====	Production =====	Other =====
OFFICE (a)	40%	55%	4%	1%
MEDICAL RESEARCH (g)	49%	27%	22%	2%
OTHER RESEARCH (b)	50%	33%	17%	1%
INDUSTRIAL (c)	26%	19%	54%	1%
WAREHOUSE (d)	24%	46%	29%	1%
RETAIL (e)	15%	46%	17%	22%
HOTEL (f)	7%	20%	5%	68%
HOSPITAL (g)	59%	19%	3%	19%
NURSING/TREATMENT (g)	27%	4%	4%	65%
MEDICAL OFFICES (g)	47%	40%	1%	12%
OTHER (g)	4%	3%	1%	92%

(a) Average of factors from ADE, Inc. employer survey and ABAG, Projections 85 (based on FIRE category for Marin Co. in 1990).

(b) Based on distribution for SIC 739, except that 21% service workers have been shifted from other to technical occupations to more accurately reflect research activities. Data provided by Steve Saxton, State Employment Data and Research Division.

(c) ADE, Employer Survey, Manufacturing category, and ABAG, Projections 85, Manufacturing category for Santa Clara County in 1990.  
The rates shown in the table assume that 50% of the industrial space will be occupied by existing firms in Marin County, and 50% will be similar to Santa Clara County firms.

(d) ABAG, Projections 85, Wholesale category for Marin County.

(e) ABAG, Projections 85. Based on Retail category for Marin Co. in 2000.

(f) San Francisco Downtown Consultant's Report. Based on hotel category.

(g) State EDD Occupational Employment Statistics Reports

(h) ADE, Inc. Employer Survey--Other category.

TABLE 4

## PROJECT EMPLOYMENT DISTRIBUTION

LAND USE	Professional, Managerial, Technical	Clerical, Admin., Sales	Production	Other	TOTAL
Office	1,021	1,412	102	20	2,556
Medical Research	408	229	186	16	839
Other Research	287	188	96	3	574
Industrial	181	130	379	7	698
Warehousing	95	178	113	5	391
Retail	68	207	77	99	450
Hotel	11	32	8	109	160
Hospital	188	61	9	62	320
Nursing/Treatment	231	36	34	562	862
Medical Offices	101	87	2	25	216
Project Wide	9	7	2	213	232
TOTAL	2,600	2,568	1,007	1,122	7,300
Percent	36%	35%	14%	15%	100%

Source: EIP Associates, based on the data in Tables 2 and 4.

The employment in the industrial category is projected at 430 sq. ft. per employee, the all-county average obtained from the ADE employer survey. For warehouse space we have used the factor from the GG+A study for warehousing/service commercial. At 767 sq. ft. per employee, this factor projects more employees than is typical for standard warehousing space; however, the project sponsor anticipates some light manufacturing to occur in this space as well.

The employment densities for the hotel and medical facilities are not included in the studies referenced above and the employment estimates are based on studies conducted by EIP Associates and Recht Hausrath Associates for other assignments as well as existing employment densities at Sutter Hospital in Novato. As noted in the Table, Sutter Hospital will be moving 130 full-time equivalent (FTE) jobs to Hamilton from its current location in Novato. Finally, the custodial and security personnel (project-wide) are estimated based on data obtained from several assignments by EIP in San Francisco. This factor is considered conservative and may in fact overstate the potential for this kind of employment at Hamilton.

## 2.2 OCCUPATIONAL DISTRIBUTION

Table 3 presents the distribution of occupations for each land use type. The number of project employees in each occupational category are shown in Table 4. The total project workforce would be 36% Professional, Managerial, and Technical (PMT) employees and 35% Clerical, Administrative, and Sales (CAS) workers. The remainder would be divided between Production and Other occupations. Most of the Other category are service workers (housekeeping, food preparation) in the health care facilities.

In the office land use category, the employer survey showed 50% of the service sector employment in PMT occupations and most of the remainder in the CAS group. ABAG data presented in Projections '85 show only 30% in the PMT category and 65% in the CAS category. The reason for this discrepancy is not clear but is likely due to the specific nature of the firms interviewed in the employer survey. For the purposes of this analysis we have used an average of the two distributions.

Similarly, in the industrial category, we have averaged the manufacturing sector from the employer survey data with ABAG data from Santa Clara County wherein a greater



concentration of high tech manufacturing establishments may be found. The resulting factors increase the proportion of technical and administrative personnel.

The medical categories, including Medical Research, are based on State EDD Occupational Employment Statistics Reports. For the Other Research category, it was necessary to adjust the data because research laboratories are included with other miscellaneous business services. The overall distribution included 21% service workers, which is a very high percentage for research establishments. Consequently, we have shifted the 21% out of the Other category and into the PMT category to reflect the higher proportion of technical and professional specialists in research firms.

The retail distribution is based on the ABAG data, while the hotel calculations are based on other studies.

### **3. RESIDENTIAL LOCATION OF THE WORKFORCE**

The 1980 Census journey to work data indicated that about 75% of the jobs in Novato were held by Marin County residents. No other surveys of this information have been done by government agencies since that time. It is likely that the proportion of project employees living in Marin would be lower for several reasons. The 1980 Census data do not reflect the more recent trends in incomes and housing prices in Marin County in relation to other areas, and also the distribution of job types at the project does not match the overall job distribution in the county. The proportion of "local serving" (retail/services) jobs in the project is lower than for the county as a whole. A greater proportion of retail/service jobs would be held by local residents.

In order to address this issue, we have analyzed more recent journey-to-work data from the employer survey and the resident origin-destination survey. We have also studied the relationship between projected worker incomes and housing prices in the region. Our approach has been to use the updated commute data as a basis, and then analyze the housing market to see if the workers' incomes and projected housing growth would support the residential distribution indicated by the travel data.

#### **3.1 TRAVEL DATA**

The 1980 Census provided data on commute patterns for employed residents living in Marin County and also for workers commuting to jobs in Marin County. The data on

employed residents are shown in Table 5. In 1980, 63% of workers living in Novato worked in Marin County and 27% in Novato itself. Twenty-eight percent commute south out of the County.

The 1986 data from the ADE resident survey (Table 6) show a higher percentage of Novato residents working in Marin County, primarily because more of the workers appear to be working in San Rafael. The percentage working in Novato is very similar at 29% and the percent working south of San Rafael in Planning Areas 4, 5, and 6 is slightly higher in the 1986 data at 15% versus 11% in 1980. In Planning Areas 2 and 3, however, the 1980 data shows 24% of Novato residents while the ADE survey shows 31% of Novato residents working in San Rafael. The primary result of this apparent shift is that fewer Novato residents are commuting to San Francisco than reported in 1980.

In terms of the commute to jobs in Marin County, it was mentioned above that the 1980 Census data includes all kinds of jobs ranging from manufacturing to services and retail. In general, service and retail jobs are more likely to be held by local residents because the jobs tend to be lower paying and often involve part-time or irregular hours. Table 7 indicates that 75% of all jobs in Novato were held by Marin County residents in 1980. About 22% were held by residents of counties to the north of Marin. In contrast, Table 8 shows the journey-to-work results from the ADE employer survey, which focused on manufacturing and office-related firms most likely to represent those that would locate at Hamilton Field. Of these kinds of jobs in Novato, only 26% are held by Novato residents and 41% are held by residents in Sonoma, Napa and Solano Counties. Overall, more than half of these jobs in Novato are held by workers residing outside of Marin County.

Other travel data such as modal split and more specific information on travel patterns in Novato and San Rafael have been developed from the ADE employer and resident surveys. This information is available from EIP Associates.

### 3.2 WORKER INCOMES AND HOUSING COSTS

In order to consider housing market constraints on the location of the workforce, we have developed a distribution of household income by occupation as shown in Table 9. This information is based on a detailed analysis of data obtained in the origin-destination survey. Each household was asked to categorize its total income (the scheme shown

TABLE 5

## Commuting Patterns of Employed Marin Residents, 1980

Place of Residence	Workplace Totals			Breakdown of Marin County Workplaces								Workplaces in other 8 Bay Area Counties		
	Marin	Other	TOTAL	PA1	PA2	PA3	PA4	PA5	PA6	IC	CC	NORTH	EAST	SOUTH
PA1-Novato Area	63%	37%	100%	27%	9%	15%	2%	5%	4%	1%	0%	5%	5%	28%
PA2-Las Gallinas	62%	38%	100%	5%	20%	21%	2%	8%	6%	0%	0%	1%	5%	32%
PA3-San Rafael Basin	63%	37%	100%	3%	9%	29%	4%	9%	7%	0%	0%	1%	7%	29%
PA4-Upper Ross Valley	65%	35%	100%	3%	6%	16%	23%	8%	8%	0%	0%	1%	4%	30%
PA5-Lower Ross Valley	49%	51%	100%	3%	5%	10%	3%	19%	10%	0%	0%	1%	4%	46%
PA6-Richardson Bay	44%	56%	100%	2%	3%	6%	2%	5%	27%	0%	0%	1%	4%	30%
Inland Corridor	71%	29%	100%	9%	6%	15%	8%	9%	12%	12%	0%	4%	3%	21%
Coastal Corridor	64%	36%	100%	6%	7%	13%	2%	11%	17%	1%	6%	0%	1%	35%
COUNTY TOTAL	58%	42%	100%	9%	8%	15%	5%	8%	12%	1%	0%	2%	4%	36%

This table describes the workplace destinations of Marin residents based on where they live in the County. For example, the first row demonstrates that among residents of PA 1 (Novato area), 63% of employed residents work in Marin, 37% work outside the County. 27% of Novato Area residents also work in PA1 (the Novato area), 7% work in PA2 (Las Gallinas Valley), etc.

Source: 1980 U.S. Census

PA1, etc. = Marin Countywide Plan Planning Areas

IC, CC = Inland Corridor, Coastal Corridor

NORTH = Sonoma, Napa and Solano Counties

EAST = Alameda and Contra Costa Counties

SOUTH = San Francisco, San Mateo and Santa Clara Counties

This table is presented as Table 9 in the Marin County Economic Element.

TABLE 6

## COMMUTING PATTERNS OF EMPLOYED MARIN COUNTY RESIDENTS, 1986

PLACE OF RESIDENCE	WORKPLACE							Subtotal OTHER COUNTIES
	Novato	San Rafael	South Marin	Subtotal MARIN COUNTY	NORTH	EAST	SOUTH	
Novato	29%	31%	15%	75%	3%	4%	19%	25%
San Rafael	7%	52%	14%	73%	0%	7%	20%	27%
South Marin	2%	13%	39%	54%	1%	5%	41%	46%

Source: EIP Associates, based on ADE, Inc. resident survey.



TABLE 7

## Commuting to Jobs in Marin, 1980

WORKPLACE = MARIN COUNTY

		MARIN	OTHER	TOTAL	PA1	PA2	PA3	PA4	PA5	PA6	IC	CC
Place of Residence												
1 Novato Area	18%				51%	17%	16%	6%	11%	7%	27%	0%
2 Las Gallinas Val.	10%				6%	23%	13%	5%	9%	5%	0%	3%
3 San Rafael Basin	13%				4%	13%	21%	11%	14%	8%	0%	12%
4 Upper Ross Valley	10%				3%	7%	9%	47%	9%	7%	5%	3%
5 Lower Ross Valley	8%				3%	5%	5%	6%	22%	8%	0%	2%
6 Richardson Bay	13%				3%	5%	6%	7%	11%	42%	3%	2%
Inland Corridor	3%				3%	2%	3%	5%	3%	3%	59%	4%
Coastal Corridor	3%				2%	2%	2%	1%	4%	5%	7%	62%
Marin Residents	79%				75%	74%	75%	88%	83%	83%	100%	88%
Subtotal												
NORTH	13%				22%	16%	17%	4%	7%	7%	0%	4%
EAST	3%				2%	4%	4%	4%	4%	3%	0%	3%
SOUTH	5%				1%	6%	5%	4%	6%	7%	0%	5%
Residents of other	21%				25%	26%	25%	12%	17%	17%	0%	12%
Counties Subtotal												
TOTAL	100%				100%	100%	100%	100%	100%	100%	100%	100%
(All Workers in Marin Jobs)												

This table describes the place of residence of persons working in jobs in Marin County. For example, the first row demonstrates that 18% of all Marin County jobs are held by residents of Planning Area 1 (Novato area), and that 51% of of all Novato area jobs are held by Novato area residents, 17% of Las Gallinas Valley jobs are held by Novato area residents, etc. In the subtotal rows we see that 79% of all Marin jobs are held by Marin residents, and that this statistic ranges from a low of 74% of Las Gallinas jobs held by local residents to a high of 100% in the Inland Corridor.

Source: 1980 U.S. Census

PA1, etc. = Marin County Planning Areas

CC = Coastal Corridor (Marin County)

IC = Inland Corridor (Marin County)

NORTH = Sonoma, Napa and Solano Counties

EAST = Alameda and Contra Costa Counties

SOUTH = San Francisco, San Mateo and Santa Clara Counties

This table is presented as Table 10 in the Marin County Economic Element.

TABLE 8

## COMMUTING TO MANUFACTURING AND OFFICE JOBS IN MARIN, 1986

PLACE OF RESIDENCE	MARIN TOTAL	WORKPLACE			
		Novato	San Rafael, Fairfax, San Anselmo	Southern Marin	West Marin
MARIN COUNTY					
Novato	22%	26%	20%	21%	15%
San Rafael, Fairfax, San Anselmo	24%	15%	26%	44%	8%
Southern Marin	5%	3%	5%	12%	38%
West Marin	1%	1%	1%	1%	0%
Marin Residents Subtotal	53%	46%	52%	78%	62%
OUTSIDE MARIN					
North	35%	41%	37%	8%	31%
East	5%	5%	5%	7%	8%
South	6%	8%	6%	4%	0%
Other	1%	1%	0%	2%	0%
Residents of Other Counties Subtotal	47%	55%	48%	22%	38%
TOTAL	100%	100%	100%	100%	100%

Source: EIP Associates, based on ADE, Inc. employer survey  
of workers hired in the last two years.

TABLE 9

PROJECTED HOUSEHOLD INCOME DISTRIBUTION  
OF THE HAMILTON WORKFORCE

(Figures are number of workers and percent within occupational categories)

OCCUPATION CATEGORY	< \$22,000	\$22,000- \$44,000	\$44,000- \$66,000	>\$66,000	TOTAL
Professional, Managerial, Technical	309 11.9%	908 34.9%	596 22.9%	788 30.3%	2600 100.0%
Clerical, Admin., Sales	542 21.1%	1148 44.7%	542 21.1%	336 13.1%	2568 100.0%
Production	252 25.0%	587 58.3%	168 16.7%	0 0.0%	1007 100.0%
Other	187 16.7%	935 83.3%	0 0.0%	0 0.0%	1122 100.0%
TOTAL WORKFORCE	1290 17.7%	3577 49.0%	1306 17.9%	1124 15.4%	7300 100.0%

Source: EIP Associates, based on ADE, Inc. Resident Survey.

across the top of Table 9 reflects an adjustment from 1986 to 1988 dollars). In addition, we obtained data on the occupations of each worker in the household. By analyzing the combinations of occupations in relation to reported household income, we estimated an average income for households containing each of the occupational categories shown in Table 9. The percentages across the bottom of the table indicate the household income distribution for the entire project workforce.

An approximate comparison of this income distribution with the 1980 Census data for Marin and Sonoma Counties is possible by escalating the 1980 income categories according to the Consumer Price Index. This operation equalizes the dollar amounts between 1980 and 1988. The results are shown in Table 10. As a general reference, Marin County shows about 51% of the households with an income below \$43,200. Sonoma County shows a much higher 69%. About 65% of the Hamilton workforce is projected to have a household income below \$44,000. The income categories between the census and the survey do not match precisely, but it can be seen that 16% of the Marin households and 27% of the Sonoma households have incomes less than \$17,300, while 19% of the project workforce would have less than \$22,000 incomes. Twenty-eight percent of the Marin households have less than \$25,900, but of these, 7% earn less than \$9,000 and are probably retired or otherwise not in the full time labor force. The overall conclusion from the data is that the project workforce would contain fewer lower income households and fewer higher income households than the population at large in Marin County. In comparison to Sonoma County, the workforce income distribution is generally shifted toward higher income brackets.

Table 11 shows the projected rent levels for the 2,600 on-site market rate rental units. The rents are based on a market study conducted by Lynn Sedway & Associates. The table also indicates the minimum household income necessary to afford these units, based on a monthly allocation of 30% of gross income as shown in the next column to the left. This allocation level is generally considered by the federal government to be the upper level of housing affordability; any amount above this level would have to be considered an overpayment for housing. In general, lower income workers would tend to pay a greater percentage (approaching 40%) of their income for housing. The required income levels would range from \$21,600 to \$26,400 for the studios to \$34,000 to \$39,120 for the three-bedroom units. Under the project sponsor's BMR proposal, 10% of the units (260) would be affordable for households ranging in income from \$21,300 (one person) to \$30,400 for a



TABLE 10

COMPARISON OF PROJECTED HAMILTON WORKFORCE HOUSEHOLD INCOMES  
WITH ADJUSTED 1980 CENSUS DATA FOR MARIN AND SONOMA COUNTIES

## ADJUSTED 1980 CENSUS HOUSEHOLD INCOME DISTRIBUTION

Income Category(a)	Marin County	Sonoma County
-----	-----	-----
Less than \$17,300	16%	27%
\$17,300-\$25,900	12%	15%
\$25,900-\$43,200	23%	27%
\$43,200-\$60,400	18%	17%
More than \$60,400	31%	14%
-----	-----	-----
TOTAL	100%	100%

## HAMILTON WORKFORCE HOUSEHOLD INCOME DISTRIBUTION

Income Category	Percent of Workers
-----	-----
Less than \$22,000	19%
\$22,000-\$44,000	46%
\$44,000-\$66,000	20%
More than \$66,000	15%
-----	-----
TOTAL	100%

Source: 1980 Census

EIP Associates based on ADE, Inc. resident survey.

(a) 1980 dollars inflated to 1988 according to CPI for all urban  
consumers in the San Francisco Bay Area.

TABLE 11

## INCOME STANDARDS FOR RENTAL UNITS

UNIT TYPE	RENT/ MONTH	RENT/ INCOME RATIO	INCOME REQUIRED
UNIT MIX 1: AVERAGE QUALITY UNITS			
STUDIO	540	30%	\$21,600
1 BEDROOM	683	30%	\$27,320
2 BEDROOM	713	30%	\$28,520
3 BEDROOM	850	30%	\$34,000
UNIT MIX 2: ABOVE AVERAGE QUALITY UNITS			
STUDIO/JR 1-BDRM	660	30%	\$26,400
1 BEDROOM	788	30%	\$31,520
2 BEDROOM/1 BATH	903	30%	\$36,120
2 BEDROOM/2 BATH	945	30%	\$37,800
3 BEDROOM	978	30%	\$39,120

Source: EIP Associates, based on rents developed by  
 Lynn Sedway & Associates.  
 Rent/ Income ratio standard determined by Federal  
 Government.

family of four. These 260 BMR rental units could house between 3.5% and 5.0% of the project workers depending on the size of units offered.

A similar analysis has been conducted for the ownership units as shown in Table 12. The qualifying income is usually based for planning purposes on 25% of the mortgage payments, but banks frequently approve loans with higher ratios, and a 30% ratio is also used in Table 13. The range of required income is \$24,712 to \$29,655 for one bedroom townhouses to \$44,370 to \$53,244 for three bedroom patio homes. Forty of these units will be offered under the same BMR income criteria discussed above for rentals.

Based on these data, we have concluded that some of the workers in the lowest income category could afford at least to rent the studio and one-bedroom apartments on-site. The project workforce would need a total of about 5,270 non-senior housing units, assuming that 260 single workers occupied the studios, and the remaining were in households with an average of 1.4 workers. This exceeds the number of units planned in the project, but suggests that the dwelling unit program is consistent with affordability criteria for a majority of the workforce. All the units could be filled by project workers if the workers desired.

We are next concerned with the affordability of housing in Novato and South Marin communities. Rents in Novato are similar to those projected for the Hamilton site which is commensurate with the workers' incomes. The average sales price for single-family housing in Novato was \$168,616 in 1986 (Lynn Sedway Associates). To purchase a house at this price requires a household income of \$56,800 (assuming a 20% down-payment and a 10% interest rate). Assuming an even distribution within the income categories in Table 10, about 42%, or 549, of the workers in the \$44,000 to \$66,000 category could afford to purchase housing at this price. This is about half of the workers that would be expected to desire ownership housing in Novato based on the 1986 journey-to-work data (7,170 workers x 26% in Novato, x 60% housing owners). Workers in the higher income category could afford housing in Novato, but many of these workers are expected to live in South Marin communities. Existing Novato residents may also be a source of labor for the project. According to the resident survey, 23% of employed Novato residents commute south over the Richmond Bridge or the Golden Gate Bridge. In 1985, this segment of the labor force represented 6,500 workers. Thus, sufficient workers would exist in the appropriate income categories and/or in the existing labor force to fill the balance of the 26.0% projection for workers living in Novato.

TABLE 12

## INCOME REQUIRED FOR FOR SALE UNITS

UNIT TYPE	TOTAL PRICE	PERCENT DOWN PYMT	LOAN AMOUNT	INTEREST RATE	AMORTI- ZATION PERIOD	MONTHLY PAYMENT	QUALI- FYING RATIO (a)	QUALI- FYING INCOME	QUALI- FYING RATIO (a)	QUALI- FYING INCOME
UNIT MIX 1: TOWNHOMES										
1 BEDROOM	\$88,000	20%	\$70,400	10.00%	30	\$617.81	25%	\$29,655	30%	\$24,712
2 BEDROOM	\$98,000	20%	\$78,400	10.00%	30	\$688.02	25%	\$33,025	30%	\$27,521
2 BEDROOM	\$110,000	20%	\$88,000	10.00%	30	\$772.26	25%	\$37,069	30%	\$30,891
Total	\$100,800	20%	\$80,640	10.00%	30	\$707.67	25%	\$33,968	30%	\$28,307
UNIT MIX 2: PATIO/ZERO-LOT-LINE										
2 BEDROOM	\$120,000	20%	\$96,000	10.00%	30	\$842.47	25%	\$40,438	30%	\$33,699
2 BEDROOM	\$143,000	20%	\$114,400	10.00%	30	\$1,003.94	25%	\$48,189	30%	\$40,158
3 BEDROOM	\$158,000	20%	\$126,400	10.00%	30	\$1,109.25	25%	\$53,244	30%	\$44,370
Total	\$136,050	20%	\$108,840	10.00%	30	\$955.15	25%	\$45,847	30%	\$38,206
TOTAL PROJECT	\$109,613	20%	\$87,690	10.00%	30	\$769.54	25%	\$36,938	30%	\$30,782

(a) Applied to mortgage payment only. Equivalent to approximately four to five percent greater qualifying ratio as applied to principal + interest + taxes (@ approx. 1.1%) + insurance (@ approx. \$500-\$600/yr.).



The next housing market critical to the analysis is that of South Marin. The journey-to-work table discussed in Section 4.2 above indicates that 19% of current Novato jobs are filled by residents of Marin south of Novato. In relation to the Hamilton workforce, this would amount to 1,387 workers, 832 (60%) of which would wish to occupy their own homes. The 1986 average housing price in South Marin is about \$197,200, based on 1980 census data escalated according to the time series data published by Northern California Real Estate Research Council (NCRRC). The household income required for purchase at this price is \$66,500. There are about 1,100 project workers estimated to have household incomes in excess of this amount. Some portion of the workers in this income bracket may purchase housing in Novato instead as discussed above, but some of the workforce residing in South Marin will also be drawn from the existing home-owning labor pool, for which current housing costs pose no constraint. Existing homeowners working at Hamilton could occupy the \$40,000-\$60,000 income bracket. The renters in South Marin (projected at 545 employees) will also occupy this income category.

Of the remaining 55% of the workers, one-third would have household incomes below \$22,000, while many of the others would have incomes approaching \$44,000. The higher income workers could find rental housing in San Francisco or elsewhere and ownership housing in Sonoma County. The lower income workers could take rental housing in the North Bay and East Bay Counties.

### 3.3 PROJECTED HOUSING GROWTH

The foregoing analysis of housing affordability indicates that if the existing income/housing price relationships between projected Hamilton workers and the Marin County housing market remain stable, the current travel patterns shown in Table 9 could continue through the buildout of the project. In the previous analysis of the first Hamilton Project (Report dated June 1986), there was a concern that insufficient housing was planned in the communities south of Novato, leading to the possibility that housing prices there may rise faster than incomes and that fewer Hamilton workers would find housing there than the current commute patterns would suggest. In Projections '85 (ABAG), it was projected that 13,400 new employment residents would settle in South Marin between 1985 and 2000; however, there were only 3,354 new housing units projected during the same period. Novato was projected to get the bulk of the County's housing growth during this period. The new Projections '87, however, indicates that the direction of planning in Marin County has changed dramatically. Housing growth in South Marin has

been increased almost three-fold, to 9,160 between 1985 and 2000. This brings the projected growth in workers into balance with the available housing ABAG has also included Hamilton Field in its housing and employment projections for Marin County, so we may presume that the appropriate share of Hamilton workers could find housing in South Marin in they so desired. At the same time, the number of new housing units in Novato has been reduced by almost 40% to 6,190 during the 1985-2000 period. This will likely affect the number of Hamilton workers residing off-site in Novato.

### 3.4 CALCULATION OF RESIDENTIAL LOCATION OF THE WORKFORCE

The primary adjustment that is necessary to the travel data in Table 9 is determining what portion of the workforce would live on-site. It is the intention of the project sponsor that 100% of the 3,000 non-senior units on-site will be occupied by project workers and a right of first refusal for project workers has been proposed as a means of attaining this goal. In addition, the project sponsor has proposed other amenities such as day care services and quality design in the units to attract project workers. On the other hand, the units as proposed are relatively small in size and no large lot single family units will be offered. At the same rental rates and housing prices, much larger units would be available further north in Sonoma County. Moreover, the attractiveness of day care services depends upon the specific situation of each family, and while certainly valuable to many, such amenities as day care may not be sufficient to attract all of the workers from cheaper housing to the north. Finally, it must be recognized that some workers prefer to live away from their workplace simply to increase the variety in their lifestyle. Consequently, we have focused our analysis of the on-site housing to the statistical parameters of the 46% of the workforce ordinarily choosing to live in Marin. Also, 130 workers employed at Sutter Hospital are assumed not to change their current residence. They are distributed in accordance with Table 8. The following discussion presents a high and low estimate of the percentage of the workers residing on-site.

If all of the workers desiring rental units in Marin choose to reside on-site, up to 1,005 units would be occupied by project workers, accounting for 31.9% of all project rental units. This is calculated by first assuming that the number of workers that would live in senior housing on-site could total as many as 28. This figure represents the maximum number of senior residents that would work in any capacity, and represents -- at one worker per household -- 5% of the households in the senior housing component (550 units). A survey of several senior housing projects in Marin County suggests that only about 5%

of the units in those projects contain one worker per household. Further, the assumption is made that all senior workers would work on-site.

Secondly, the total number of on-site studio units that could be occupied by project workforce renters, at 1 worker per household, would be 260.

The remaining 1,004 project workforce renters at 1.4 workers per household, and assuming workforce workers would group into common households, would occupy an additional 977 units on-site.

If 100% of project workforce renters do not choose housing on-site, we would assume that they would be distributed evenly among all new rental housing units in Marin. The project would represent up to 41.8% of new rental housing growth in Marin over the 1990-2000 planning period. Applying this percentage to the maximum number of workforce renter households (1,005) to reflect the possibility that workers may reside in units off-site in a similar proportion, up to 420 households (13.3% of total project rental units) would choose to reside on-site.

This lower estimate is not necessarily more realistic than the higher estimate, however. City staff indicate that a portion of the City's rental housing stock includes single-family detached and condominium units, which tend to have higher rent levels for units with the same number of bedrooms as apartments. The bulk of these units are located off-site. These two facts would act to increase the number of project workforce renters that would live on-site, as single-family and condominium units would not be comparable to project site units. In addition, the project sponsor's program to provide project workers with the right of first refusal would boost the number of workers choosing on-site housing by increasing its accessibility in an otherwise tight housing market.

Thus, the number of project workforce renters choosing to live on-site could be between 41.8-100% of the total choosing to reside in Marin, which would represent 6.8-17.7% of the project workforce. For the purposes of this analysis, we have taken the average of the high and low estimates of households (420-1,005) as the number that would actually live on-site. This equals 712 households and 896 worker-occupants, or 12.3% of the total.



A similar analysis was conducted for the ownership units. The 400 on-site units represent 5.6% of the projected for-sale housing growth in Marin. Between 77 (at 5.6% of the worker demand for ownership housing) and 400 (at 100% of the units available on-site) of the units could be occupied by project workers. The mid-point is 239 units, occupied by 334 workers, or 4.6% of the total workforce. Together with the rental units, there would be a total of 1,230 workers, 16.8% of the total workforce, occupying 951 units on-site, 27.8% of the total.

For the remainder of the Marin housing market, it is assumed that Hamilton workers would choose housing in proportion to its availability in each sub-area -- Novato and South Marin (including San Rafael). The projected housing growth in Novato, both rental and ownership, equals 34.0% of the new housing projected in Marin County (excluding the Hamilton site). A total of 828 workers, or 11.3% of the project workforce, is estimated to live in Novato. This is estimated by multiplying the number of workers living in Marin but not on-site, 2,399, by 32.9% and then adding 26% of the 130 employees currently at Sutter Hospital. Of the 790 new workers, 263 would occupy rental housing and 528 would purchase housing.

The remaining 1,299 Marin workers (17.8%) would live in South Marin.

Table 13 summarizes this analysis as well as the results for the Alternatives.

#### Alternative 1

This alternative reduces the number of rental units by 200, but increases the workforce by about 790 workers. The increased workforce means that a greater number will choose to live on-site, although this number, 1,319, is only 16.3% rather than 16.8% of the total workforce.

The number of project workers living in Novato would increase by 94. The total of 922 is 11.4% of the workforce. Novato does not pick up much of an increased share, despite the lower share in on-site housing, because of the smaller growth projected in the Novato housing market. However, there would be a shift in where workers look for housing, resulting in a 0.5% higher share in South Marin.

## Alternative 2

This alternative reduces the on-site housing stock by 1,550 units, but only decreases the project employment by 739 workers. Therefore, the number of workers living on-site decreases to 925, or 14.1% of the total. The share of workers living in Novato increases to 11.7%, but this is not enough to completely offset the reduction in the number of workers living in Marin County due to the reduced housing opportunities on-site. We estimate that the share of workers residing in Sonoma and Napa Counties will increase by 0.8% to 41.8% and the number residing in the East Bay communities will also rise 0.4% to 5.4%. The South Marin share remains constant at 19%.

## Alternative 3

This alternative adds 200 units to the on-site housing stock, and also reduces the project workforce 2,500. On a proportional basis, more workers would reside on-site, although the actual number of units occupied by project workers would decrease by 330. We estimate that 18.7% of the workforce would reside on-site, 11.5% in Novato and 15.8% in South Marin.

In general, Table 13 is consistent with existing travel patterns to jobs in Novato as presented in Table 8, but the residential distribution of the labor force in Marin County has been modified to reflect the projected growth in housing in the County. The distribution for other counties has also been modified for certain of the alternatives. The information in Table 13 will be used as impact assumptions for the traffic analysis in the EIR.

### 3.5 COMMUTE PATTERN OF NON-PROJECT WORKERS RESIDING IN ON-SITE HOUSING

We have estimated that 27.0% of the housing on-site would be occupied by project workers. The remaining 2,069 non-senior units would be occupied by about 2,900 workers employed off-site. Based on the journey-to-work data in Table 7, we estimate that 29% of these workers would be employed elsewhere in Novato. Forty-six percent would be employed in Marin County south of Novato. Four percent would commute across the Richmond Bridge to the East Bay and 19% would use the Golden Gate Bridge to San Francisco. The remaining 3% would commute north. Overall then, 32%, or 928 of the workers would commute north from Hamilton Field, and 68%, or 1,972 workers would commute south.



For Alternative 1, there would be 1,718 project units occupied by 2,405 workers with jobs off-site. About 770 (32%) of the workers would commute north and 1,635 (68%) would commute south.

For Alternative 2, 474 off-site workers would commute north and 1,007 would commute south.

Alternative 3 would have 3,500 off-site workers living in Hamilton. About 1,120 of these (32%) would commute north and 2,380 would commute south to work.

TABLE 13

RESIDENTIAL LOCATION OF HAMILTON WORKFORCE  
Number of Workers

Location =====	Proposed Project		Alternative 1		Alternative 2		Alternative 3	
	Percent =====	Number =====	Percent =====	Number =====	Percent =====	Number =====	Percent =====	Number =====
On-site Housing	16.8%	1,229	16.3%	1,319	14.1%	925	18.7%	897
Other Novato	11.3%	828	11.4%	922	11.7%	768	11.5%	552
South Marin	17.8%	1,299	18.3%	1,480	19.0%	1,247	15.8%	758
 SUBTOTAL MARIN	 46.0%	 3,357	 46.0%	 3,721	 44.8%	 2,939	 46.0%	 2,207
 San Francisco	 8.0%	 584	 8.0%	 647	 8.0%	 525	 8.0%	 384
 Sonoma County	 36.0%	 2,628	 36.0%	 2,912	 36.4%	 2,388	 36.0%	 1,727
Napa/Vallejo	5.0%	365	5.0%	405	5.4%	354	5.0%	240
 Richmond/ Alameda Co./ Other	 5.0%	 365	 5.0%	 405	 5.4%	 354	 5.0%	 240
 TOTAL WORKFORCE	 100.0%	 7,300	 100.0%	 8,090	 100.0%	 6,561	 100.0%	 4,797

Source: EIP Associates, based on ADE, Inc. employer survey and housing affordability analysis discussed in text.



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## TRAFFIC AND TRANSPORTATION





The pages contain supplemental background material which supports the Hamilton Field EIR transportation section. The following are included in this document:

1. Traffic volume projections for the AM peak hour and PM peak hour for the project and the three alternatives to the project.
2. The Highway 101/State Route 37 Traffic Study which was prepared for the City of Novato as input to Caltrans in their preparation of the Project Study Report (PSR).
3. Weaving movement calculations on Highway 101 for cumulative traffic conditions with the project.



## PROJECTED TRAFFIC VOLUMES

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- EXISTING PLUS PROJECT  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	398	569	0	0	0	0	0	1110	580	319	0	352
2 NAVE DRIVE/ STATE ACCESS ROAD	398	658	0	0	0	0	0	860	602	309	0	372
3 NAVE DRIVE/ MAIN GATE ROAD	477	947	0	0	0	0	0	1015	217	109	0	261
4 NAVE --SOUTH/ NB 101 RAMP	0	1423	50	100	0	0	94	1141	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	298	1161	30	50
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMP	1261	50	0	0	0	0	0	50	380	30	0	338
9 SB HWY 101 RAMP/ IGNACIO BOUEVARD	1586	0	0	280	434	30	370	120	550	70	282	130
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	455	272	1750	820	0	0	0	0	150	210	100
12 NAVE DRIVE/ NB 101 OFF-RAMP	0	777	241	30	0	510	190	1660	0	0	0	0
14 NAVE DRIVE/ BOLING	0	1273	0	0	0	0	0	945	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existAM.BGV  
 Generation file: HAM2am.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:19:56  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- EXISTING PLUS PROJECT  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	401	1204	0	0	0	0	0	768	388	614	0	461
2	NAVE DRIVE/ STATE ACCESS ROAD	421	1026	0	0	0	0	0	902	327	579	0	521
3	NAVE DRIVE/ MAIN GATE ROAD	308	1273	0	0	0	0	0	1342	81	175	0	569
4	NAVE --SOUTH/ NB 101 RAMPS	0	1580	100	290	0	0	298	1343	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	107	1513	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1363	260	0	0	0	0	0	60	60	30	0	207
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	916	0	0	200	471	60	280	90	200	230	711	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	899	771	1317	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1579	529	70	0	620	300	1087	0	0	0	0
14	NAVE DRIVE/ BOLING	0	1100	0	0	0	0	0	1421	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existPM.BGV  
 Generation file: HAM2pm.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:19:56  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- EXISTING PLUS PROJECT -- WITH TRI  
AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	331	514	0	0	0	0	0	1011	481	264	0	293
2	NAVE DRIVE/ STATE ACCESS ROAD	331	580	0	0	0	0	0	783	520	265	0	313
3	NAVE DRIVE/ MAIN GATE ROAD	396	811	0	0	0	0	0	895	201	99	0	220
4	NAVE --SOUTH/ NB 101 RAMPS	0	1207	50	100	0	0	83	991	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	250	1011	30	50
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1111	50	0	0	0	0	0	50	380	30	0	290
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1401	0	0	280	422	30	370	120	550	70	268	130
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	378	258	1553	820	0	0	0	0	150	210	100
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	685	223	30	0	510	190	1463	0	0	0	0
14	NAVE DRIVE/ BOLING	0	1057	0	0	0	0	0	785	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existAM.BGV  
 Generation file: HAM2am.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:19:56  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- EXISTING PLUS PROJECT -- WITH TRI  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	333	1100	0	0	0	0	0	702	322	510	0	383
2	NAVE DRIVE/ STATE ACCESS ROAD	353	940	0	0	0	0	0	812	273	493	0	443
3	NAVE DRIVE/ MAIN GATE ROAD	257	1136	0	0	0	0	0	1185	69	157	0	484
4	NAVE --SOUTH/ NB 101 RAMPS	0	1393	100	290	0	0	253	1147	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	91	1317	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1167	260	0	0	0	0	0	60	60	30	0	191
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	799	0	0	200	455	60	280	90	200	230	695	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	746	755	1185	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1411	489	70	0	620	300	955	0	0	0	0
14	NAVE DRIVE/ BOLING	0	913	0	0	0	0	0	1179	0	0	0	0

Link data file: G\_NOPKWY.LNK  
Distribution file: DIST3  
Existing Traffic file: existPM.BGV  
Generation file: HAM2pm.GEN  
Geometry file: ALT\_G97.GEO  
Reduction factor: 0.83  
Time of run: 09:19:56  
Date of run: 07/07/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 1

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	421	480	0	0	0	0	0	1145	615	230	0	332
2	NAVE DRIVE/ STATE ACCESS ROAD	421	662	0	0	0	0	0	844	633	238	0	352
3	NAVE DRIVE/ MAIN GATE ROAD	520	992	0	0	0	0	0	974	222	91	0	255
4	NAVE --SOUTH/ NB 101 RAMPS	0	1512	50	100	0	0	99	1090	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	329	1110	30	50
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1210	50	0	0	0	0	0	50	380	30	0	369
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1660	0	0	280	431	30	370	120	550	70	243	130
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	309	233	1821	820	0	0	0	0	150	210	100
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	592	247	30	0	510	190	1731	0	0	0	0
14	NAVE DRIVE/ BOLING	0	1362	0	0	0	0	0	898	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT1.DIS  
 Existing Traffic file: existAM.BGV  
 Generation file: ALT\_1\_AM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:11:13  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 1

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	379	1208	0	0	0	0	0	677	297	618	0	474
2	NAVE DRIVE/ STATE ACCESS ROAD	399	1003	0	0	0	0	0	897	254	584	0	534
3	NAVE DRIVE/ MAIN GATE ROAD	302	1229	0	0	0	0	0	1368	63	174	0	604
4	NAVE --SOUTH/ NB 101 RAMPS	0	1531	100	290	0	0	327	1375	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	112	1545	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1395	260	0	0	0	0	0	60	60	30	0	212
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	773	0	0	200	431	60	280	90	200	230	696	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	896	756	1134	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1562	554	70	0	620	300	904	0	0	0	0
14	NAVE DRIVE/ BOLING	0	1051	0	0	0	0	0	1482	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT1.DIS  
 Existing Traffic file: existPM.BGV  
 Generation file: ALT\_1\_PM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:11:13  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR--ALT 1--WITH TRIP REDUCTION PROGRAM  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	349	440	0	0	0	0	0	1041	511	190	0	275
2 NAVE DRIVE/ STATE ACCESS ROAD	349	584	0	0	0	0	0	770	546	206	0	295
3 NAVE DRIVE/ MAIN GATE ROAD	431	849	0	0	0	0	0	861	205	84	0	215
4 NAVE --SOUTH/ NB 101 RAMPS	0	1280	50	100	0	0	87	949	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	277	969	30	50
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1069	50	0	0	0	0	0	50	380	30	0	317
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1463	0	0	280	419	30	370	120	550	70	236	130
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	257	226	1612	820	0	0	0	0	150	210	100
12 NAVE DRIVE/ NB 101 OFF-RAMP	0	532	229	30	0	510	190	1522	0	0	0	0
14 NAVE DRIVE/ BOLING	0	1130	0	0	0	0	0	746	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT1.DIS  
 Existing Traffic file: existAM.BGV  
 Generation file: ALT\_1\_AM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:11:13  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR--ALT 1--WITH TRIP REDUCTION PROGRAM  
 PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	315	1103	0	0	0	0	0	626	246	513	0	393
2	NAVE DRIVE/ STATE ACCESS ROAD	335	921	0	0	0	0	0	807	213	497	0	453
3	NAVE DRIVE/ MAIN GATE ROAD	252	1100	0	0	0	0	0	1207	54	156	0	513
4	NAVE --SOUTH/ NB 101 RAMPS	0	1352	100	290	0	0	276	1174	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	95	1344	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1194	260	0	0	0	0	0	60	60	30	0	195
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	681	0	0	200	422	60	280	90	200	230	683	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	744	743	1033	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1397	509	70	0	620	300	803	0	0	0	0
14	NAVE DRIVE/ BOLING	0	872	0	0	0	0	0	1230	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT1.DIS  
 Existing Traffic file: existPM.BGV  
 Generation file: ALT\_1\_PM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:11:13  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 2

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	358	405	0	0	0	0	0	1048	518	155	0	221
2	NAVE DRIVE/ STATE ACCESS ROAD	358	585	0	0	0	0	0	717	552	178	0	241
3	NAVE DRIVE/ MAIN GATE ROAD	446	865	0	0	0	0	0	753	206	77	0	185
4	NAVE --SOUTH/ NB 101 RAMPs	0	1311	50	100	0	0	84	814	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	287	834	30	50
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPs	934	50	0	0	0	0	0	50	380	30	0	327
9	SB HWY 101 RAMPs/ IGNACIO BOUEVARD	1479	0	0	280	417	30	370	120	550	70	225	130
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	210	215	1626	820	0	0	0	0	150	210	100
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	476	215	30	0	510	190	1536	0	0	0	0
14	NAVE DRIVE/ BOLING	0	1161	0	0	0	0	0	608	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT2.DIS  
 Existing Traffic file: existAM.BGV  
 Generation file: ALT\_2\_AM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:18:20  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 2

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	256	1086	0	0	0	0	0	582	202	496	0	377
2	NAVE DRIVE/ STATE ACCESS ROAD	276	858	0	0	0	0	0	782	177	483	0	437
3	NAVE DRIVE/ MAIN GATE ROAD	216	982	0	0	0	0	0	1174	45	153	0	506
4	NAVE --SOUTH/ NB 101 RAMPS	0	1197	100	290	0	0	278	1132	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	88	1302	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1152	260	0	0	0	0	0	60	60	30	0	188
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	603	0	0	200	411	60	280	90	200	230	677	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	723	737	943	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1370	501	70	0	620	300	713	0	0	0	0
14	NAVE DRIVE/ BOLING	0	717	0	0	0	0	0	1190	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT2.DIS  
 Existing Traffic file: existPM.BGV  
 Generation file: ALT\_2\_PM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:18:20  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 2 -- WITH TRIP REDUCTION  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	297	379	0	0	0	0	0	960	430	129	0	184
2 NAVE DRIVE/ STATE ACCESS ROAD	297	520	0	0	0	0	0	665	479	156	0	204
3 NAVE DRIVE/ MAIN GATE ROAD	370	744	0	0	0	0	0	678	191	73	0	157
4 NAVE --SOUTH/ NB 101 RAMPS	0	1114	50	100	0	0	75	720	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	242	740	30	50
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	840	50	0	0	0	0	0	50	380	30	0	282
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1313	0	0	280	407	30	370	120	550	70	221	130
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	174	211	1450	820	0	0	0	0	150	210	100
12 NAVE DRIVE/ NB 101 OFF-RAMP	0	435	202	30	0	510	190	1360	0	0	0	0
14 NAVE DRIVE/ BOLING	0	964	0	0	0	0	0	505	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT2.DIS  
 Existing Traffic file: existAM.BGV  
 Generation file: ALT\_2\_AM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:18:20  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 2 -- WITH TRIP REDUCTION  
 PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	212	1001	0	0	0	0	0	547	167	411	0	313
2 NAVE DRIVE/ STATE ACCESS ROAD	232	801	0	0	0	0	0	712	148	413	0	373
3 NAVE DRIVE/ MAIN GATE ROAD	181	895	0	0	0	0	0	1046	39	139	0	432
4 NAVE --SOUTH/ NB 101 RAMPS	0	1075	100	290	0	0	236	972	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	75	1142	10	100
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	992	260	0	0	0	0	0	60	60	30	0	175
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	540	0	0	200	405	60	280	90	200	230	667	420
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	600	727	875	270	0	0	0	0	710	590	80
12 NAVE DRIVE/ NB 101 OFF-RAMP	0	1237	465	70	0	620	300	645	0	0	0	0
14 NAVE DRIVE/ BOLING	0	595	0	0	0	0	0	988	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: ALT2.DIS  
 Existing Traffic file: existPM.BGV  
 Generation file: ALT\_2\_PM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:18:20  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 3

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	314	561	0	0	0	0	0	970	440	311	0	357
2	NAVE DRIVE/ STATE ACCESS ROAD	314	573	0	0	0	0	0	842	486	303	0	377
3	NAVE DRIVE/ MAIN GATE ROAD	360	778	0	0	0	0	0	1024	194	109	0	253
4	NAVE --SOUTH/ NB 101 RAMPS	0	1138	50	100	0	0	85	1153	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	223	1173	30	50
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1273	50	0	0	0	0	0	50	380	30	0	263
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1320	0	0	280	420	30	370	120	550	70	284	130
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	444	274	1470	820	0	0	0	0	150	210	100
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	767	236	30	0	510	190	1380	0	0	0	0
14	NAVE DRIVE/ BOLING	0	988	0	0	0	0	0	947	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existAM.BGV  
 Generation file: ALT\_3\_AM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:16:33  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 3

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	403	1087	0	0	0	0	0	756	376	497	0	393
2	NAVE DRIVE/ STATE ACCESS ROAD	423	1009	0	0	0	0	0	833	316	482	0	453
3	NAVE DRIVE/ MAIN GATE ROAD	296	1276	0	0	0	0	0	1207	80	156	0	471
4	NAVE --SOUTH/ NB 101 RAMPS	0	1571	100	290	0	0	234	1174	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	94	1344	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1194	260	0	0	0	0	0	60	60	30	0	194
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	889	0	0	200	472	60	280	90	200	230	699	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	726	759	1291	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1395	480	70	0	620	300	1061	0	0	0	0
14	NAVE DRIVE/ BOLING	0	1091	0	0	0	0	0	1187	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existPM.BGV  
 Generation file: ALT\_3\_PM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 1.00  
 Time of run: 09:16:33  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 3 -- WITH TRIP REDUCTION  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	261	509	0	0	0	0	0	895	365	259	0	296
2	NAVE DRIVE/ STATE ACCESS ROAD	261	509	0	0	0	0	0	768	423	260	0	316
3	NAVE DRIVE/ MAIN GATE ROAD	299	671	0	0	0	0	0	903	182	99	0	214
4	NAVE --SOUTH/ NB 101 RAMPS	0	970	50	100	0	0	75	1001	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	30	110	5	5	5	20	40	50	188	1021	30	50
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1121	50	0	0	0	0	0	50	380	30	0	228
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1181	0	0	280	410	30	370	120	550	70	269	130
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	420	368	259	1320	820	0	0	0	0	150	210	100
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	678	219	30	0	510	190	1230	0	0	0	0
14	NAVE DRIVE/ BOLING	0	820	0	0	0	0	0	786	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existAM.BGV  
 Generation file: ALT\_3\_AM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:16:33  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

EXISTING PLUS PROJECT -- HAM FIELD EIR -- ALTERNATIVE 3 -- WITH TRIP REDUCTION  
 PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	334	1003	0	0	0	0	0	692	312	413	0	327
2	NAVE DRIVE/ STATE ACCESS ROAD	354	926	0	0	0	0	0	754	264	412	0	387
3	NAVE DRIVE/ MAIN GATE ROAD	247	1139	0	0	0	0	0	1073	68	141	0	403
4	NAVE --SOUTH/ NB 101 RAMPS	0	1386	100	290	0	0	199	1006	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	60	50	5	5	40	40	110	70	80	1176	10	100
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1026	260	0	0	0	0	0	60	60	30	0	180
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	777	0	0	200	457	60	280	90	200	230	686	420
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	230	602	746	1164	270	0	0	0	0	710	590	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	0	1258	447	70	0	620	300	934	0	0	0	0
14	NAVE DRIVE/ BOLING	0	906	0	0	0	0	0	986	0	0	0	0

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: existPM.BGV  
 Generation file: ALT\_3\_PM.GEN  
 Geometry file: ALT\_G97.GEO  
 Reduction factor: 0.83  
 Time of run: 09:16:33  
 Date of run: 07/07/88  
 Wilbur Smith and Associates, 1986,87,88

**NOVATO**

**U.S. 101/S.R. 37 PSR  
TRAFFIC STUDY**

PREPARED FOR  
THE CITY OF NOVATO



WILBUR SMITH ASSOCIATES

**APRIL 21, 1988**



WILBUR  
SMITH  
ASSOCIATES  
ENGINEERS • PLANNERS

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April 21, 1988

Tom Nolan  
City Engineer  
City of Novato  
Department of Public Works  
901 Sherman  
Novato, California 94947

Dear Tom:

We are pleased to submit our technical response, "Highway 101/State Route 37 PSR Traffic Projections". It contains the year 1997 and 2010 traffic projections for the two Highway 101 alternatives and four transitway/parkway scenarios, as well as the assumptions behind these projections.

Please be advised that the contents of this submittal supercede the previous transmittals. It is important to note that Korve Engineering has prepared two revised sets of geometrics: one designed to accommodate year 1997 project demand and the other for year 2010. This latest set of geometrics would provide adequate capacity (Level of Service D or better) on local streets for year 2010 traffic projections without the transitway and without McInnis Parkway, but the TSM program in effect.

This submittal should fulfill our contract for this study. Should additional information be requested, we stand ready to be of service. Please advise us if you need anything further at this time.

Respectfully submitted,

William E. Hurrell  
Associate

WEH/GSF:ld  
243800

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          Transitway

ALTERNATIVE G PEAK HOUR TRAFFIC FLOW PROJECTIONS ON LOCAL STREETS

ALTERNATIVE F PEAK HOUR TRAFFIC FLOW PROJECTIONS ON LOCAL STREETS

TSM SCENARIO ALTERNATIVE G PEAK HOUR TRAFFIC FLOW PROJECTIONS ON  
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## INTRODUCTION

This report is the result of a Memorandum of Understanding (MOU) between Caltrans and the City of Novato (Agreement #1725, June 2, 1987) which proposes to develop the ultimate (20 year) improvements on Highway 101 and State Route 37, including the interchanges north of the Marinwood interchange up to and including the Rowland Boulevard interchange on Highway 101 and to the Atherton interchange on State Route 37. One key impetus of the study is the proposed land development at Hamilton Field. This particular development is noteworthy in that the intensity of land development on this site would influence the phasing of intermediate highway improvements and the traffic mitigation which would be associated with proposed land development.

The purpose of this traffic study was to forecast ultimate (Year 2010) travel demand on U.S. 101 between a point just south of the Alameda del Prado interchange up to the Rowland interchange and on State Route 37 between U.S. 101 and the Atherton interchange. The chief goal of providing these forecasts was to test a series of alternative interchange improvements for the specified study years of 1987, 1997, and 2010. Also evaluated were the impacts of a potential transitway along the Northwest Pacific Railroad right-of-way and of a potential new arterial to be located between Novato to the north and the Marin County Civic Center to the south. This east-side arterial is hereafter referred to as the McInnis Parkway.

Traffic volumes were projected for the following years:

- Year 1987 (Existing Conditions);
- Year 1997 (Including buildout of Hamilton Field); and
- Year 2010 (Ultimate buildout).

For the years 1997 and 2010, the carrying capacity of the potential transitway and McInnis Parkway were considered. In all, traffic was assigned to the network for four transit/parkway scenarios.

1. Neither the McInnis Parkway nor the transitway;
2. McInnis Parkway only;
3. The transitway only; and
4. Both the transitway and McInnis Parkway.

Before the traffic forecasts are presented, this report contains a summary of the analysis assumptions which were used in the process of the study. This section contains land-use, trip generation and trip distribution assumptions, as well as comments on methodology where appropriate. After this section, traffic forecasts are presented for each year, including existing conditions. In addition to graphic illustrations of projected traffic flows, various screen-line analysis and origin/destination matrices are presented. It will be possible for the City of Novato and Caltrans to evaluate additional alternative U.S. 101/S.R. 37 interchange configurations with this additional information.

Because the proposed development at Hamilton Field plans to incorporate a Transportation System Management Plan (TSM) plan, the impacts of the TSM plan on traffic generation were evaluated in this study. This analysis is presented in addition to initial analysis. The initial analysis does not include reductions in trip generations due to the TSM plan at Hamilton Field.

#### Highway 101 Interchange Alternatives

A series of design concepts have been developed for the ongoing planning study. Two of these concepts were selected as potential feasible alternatives and traffic assignments were made

on these two networks. These design concepts are referred to as Alternative F and Alternative G in the appendix of this report.

Alternative G - The geometric improvements which would influence travel patterns for this improvement are listed below:

- 1.) A new northbound on-ramp would be constructed on Nave Drive, south of the Ignacio Blvd./Bel Marin Keys intersection, and adjacent to the existing Highway 101 off-ramp;
- 2.) A third eastbound lane would be added to the Ignacio Boulevard overpass. The new lane would begin as a free right-turn lane from the southbound loop off-ramp and would end as a right-turn only lane at Nave Drive;
- 3.) Left turns from eastbound Ignacio Boulevard to the northbound Highway 101 on-ramp would be eliminated. Two through lanes to Bel Marin Keys Boulevard would remain. The right most through lane was assumed to function as an optional right-through lane;
- 4.) Enfrente Drive would be widened to permit three southbound approach lanes at the Ignacio Boulevard intersection: a left-turn lane, a shared left-straight lane, and one right-turn lane;
- 5.) Left-turn movements from the southbound Highway 101 loop ramp, located in the southwest quadrant of the Ignacio Blvd./Highway 101 interchange would be eliminated; and
- 6.) A number of roadway widenings and roadway improvements along Nave Drive and Alameda del Prado would be installed.

Alternative F - The improvements for this alternative would be nearly identical to Alternative G except for the southbound Highway 101 off-ramp which feeds into Enfrente Drive. This southbound straight off-ramp at Ignacio Boulevard would be relocated slightly to the east. This improvement would separate flows on the off-ramp from Enfrente Road traffic. The ramp would terminate as a right-turn only intersection with Ignacio Boulevard. A coordinated traffic signal would control these movements as well as Enfrente Road movements to avoid conflicts between the two closely spaced intersections. The geometry of this alternative is discussed below as it differs from Alternative G:

- 1.) Only two approach lanes would be constructed at the Enfrente Drive approach to Ignacio Boulevard;
- 2.) A double-loop off-ramp would be constructed on the southwest quadrant of the Ignacio Boulevard/Highway 101 interchange; and
- 3.) The new southbound off-ramp would be constructed as a double-lane ramp, ending as a double right turn at the Ignacio Boulevard intersection.



## ANALYSIS ASSUMPTIONS

Future travel estimates were based on increases in traffic generation due to the proposed land development at Hamilton Field, other planned and potential growth in the Ignacio Boulevard/Alameda del Prado Area, and increases in commuter travel demand between Sonoma and the southern Counties. The land use assumptions for the Hamilton Field development were obtained through consultation with the developer and the City of Novato. Future land uses in the Ignacio Boulevard/Alameda del Prado Area were estimated in previous work conducted for the City of Novato.<sup>1</sup> Cumulative through-traffic forecasts on Highway 101 were based on ABAG's Projections 87, which concur with local land use plans in Marin County, Sonoma County and the Bay Area.

This section presents the assumptions on trip generation, land use, and trip distribution. These assumptions have been reviewed by the City of Novato and by the Caltrans District 4 Project Development Department and Transportation Studies Departments. Both agencies concur with these analysis assumptions.

### Trip Generation Rates

After reviewing several sources for trip generation rates, including the ITE's Trip Generation (4th Edition), the rates shown in Table 1 were selected for use in this study. These trip generation rates have been reviewed by Caltrans District 4 staff and have been informally acknowledged as reasonable.

---

<sup>1</sup>Ignacio Boulevard/Alameda del Prado Area Traffic Study, Wilbur Smith Associates, 1986.

Table 1

## ASSUMED TRIP GENERATION RATES

Novato U.S. 101/S.R. 37 PSR Traffic Study

<u>LAND USE</u>	<u>DAILY TRIP</u>	<u>AM PEAK HOUR TRIP</u>		<u>PM PEAK HOUR TRIP</u>	
	<u>GENERATION</u>	<u>GENERATION RATE</u>		<u>GENERATION RATE</u>	
<u>HOUSING</u>	<u>RATE</u>	<u>INBOUND</u>	<u>OUTBOUND</u>	<u>INBOUND</u>	<u>OUTBOUND</u>
Apartments - per d.u.	6.1	0.10	0.44	0.46	0.22
Retirement Unit <sup>1</sup>	3.3	0.10	0.30	0.25	0.15
For Sale Housing - per d.u.	10.1	0.20	0.55	0.63	0.37
<u>MEDICAL</u>					
Hospital - per employee	5.2	0.22	0.08	0.22	0.06
Medical Office - per 1,000 sq. ft.	34.2	0.91	0.72	0.98	2.65
Specialized Conv. Center - per bed	2.6	0.10	0.04	0.005	0.16
<u>RETAIL</u>					
Scattered Neighborhood Retail - per 1,000 sq. ft	166.4	2.20	2.19	9.41	9.41
Retail Center (200 T.S.F.) per 1,000 sq. ft.	58.9	0.74	0.58	2.24	2.25
<u>OTHER COMMERCIAL</u>					
Hotel - per room	8.7	0.46	0.24	0.36	0.31
Office - per employee <sup>2</sup>	3.4	0.44	0.07	0.08	0.40
Research and Development per 1,000 sq. ft.	6.1	1.13	0.11	0.15	0.84
Light Industrial - per 1,000 sq. ft.	7.0	0.84	0.12	0.12	0.91
Warehousing - per 1,000 sq. ft.	4.9	0.39	0.18	0.32	0.55

Source: Trip Generation, Fourth Edition, ITE, 1987<sup>1</sup> Assumes that comprehensive retirement facilities are provided.<sup>2</sup> Assumes 300 sq. ft. per employee

Wilbur Smith Associates, March 24, 1988

Residential dwelling units were divided into three categories: apartments, for-sale housing, and a retirement center. The daily trip rates for these three land uses are 6.1 trips per apartment dwelling, 10.1 trips per for-sale unit and 3.3 trips per retirement unit. These rates reflect the travel characteristics typical of each type of residential development.

Medical uses were also divided into three categories of use: medical office, hospital, and a specialized convalescent center. The different rates for each use reflects the level of driving activity associated with each use. The daily trip rates used were 34.2 trips per 1,000 square feet of medical office space, 5.2 trips per hospital employee and 2.6 trips per bed at the specialized convalescent center.

Retail space was divided into two categories in order to reflect the different types of retail use in the area. The rate of 58.9 trips per 1,000 square feet per day was used for retail centers which would encompass between 100,000 square feet and 200,000 square feet of floor space. For neighborhood retail, the daily trip generation rate used in the study was 166.4 trips per 1,000 square feet per day. In the Hamilton Field area, it was assumed that 75 percent of the retail-center generated trips would be internal to the Hamilton Field site and that 95 percent of the scattered neighborhood retail trips would be internal to the Hamilton Field site.

The trip generation rates which were used for other commercial land uses were divided into the following categories: hotel, office, research and development, light industrial, and warehousing. Hotels generate an average of 8.7 trips per room per day. Of the remaining land uses, office space generates the highest volume of traffic (3.4 trips per employee per day, or about 11 trips per 1,000 square feet at 1 employee per 300 square feet), followed by light industrial uses (7.0 trips per 1,000

square feet per day) and research and development (6.1 trips per 1,000 square feet per day). Finally, warehousing was estimated to generate only 4.9 trips per 1,000 square feet per day.

#### Trip Generation - Hamilton Field

Most of the anticipated growth within the study area would occur at Hamilton Field. The land use types and intensities in this area, as well as the resulting daily, AM peak hour, and PM peak hour trip generation are shown in Table 2-A. These land uses are based on the land use assumptions presented in the Revised Hamilton Field Masterplan, developed by the Berg-Revoir Corporation.

A detailed traffic reduction program has been prepared by Berg-Revoir Corporation. This would be incorporated into the project as a condition of approval of the Master Plan by the City of Novato. Peak hour trip generation with the traffic reduction program is shown in Table 2-B.

#### Trip Generation - Other Nearby Novato

Numerous potential projects in the Alameda del Prado/Ignacio Boulevard/Bel Marin Keys area would have an impact on the local roadway system. The incremented increase in land use assumed in this study is reflected by the list of projects shown in Table 3. This growth represents buildout conditions in the study area under the City of Novato General Plan. The projects shown in Table 3 include land uses which are long-term plans, short-term plans, approved projects, and projects under construction or newly built but unoccupied at the time of the traffic counts.

Table 2  
TRIP GENERATION  
Hamilton Field Traffic Impact Study

TYPE OF GENERATOR	SIZE	UNITS	ONE-WAY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				INBOUND	OUTBOUND	TOTAL	INBOUND	OUTBOUND	TOTAL
Apartments	2,600	d.u.	15,860	260	1,140	1,400	1,200	750	1,770
Medical Office	60	t.s.f.	2,050	50	40	90	60	160	220
Hotel	200	rooms	1,740	90	50	140	70	60	130
Retirement Apartment	550	d.u.	1,820	60	170	230	140	80	220
Office <sup>1</sup>	2,300	employees	7,820	1,010	160	1,170	180	920	1,100
Warehousing	300	t.s.f.	1,470	120	50	170	100	170	270
Research and Development	740	t.s.f.	4,510	840	80	920	110	620	730
Hospital	431	employees	2,240	90	30	120	90	30	120
Specialized Convalescent Center	480	beds-est.	1,250	50	20	70	20	80	100
Neighborhood Retail	60	t.s.f.	9,980	130	130	260	560	560	1,120
Retail Center	190	t.s.f.	11,190	140	110	250	430	430	860
For Sale Homes	400	d.u.	4,040	80	220	300	250	150	400
Light Industrial	300	t.s.f.	<u>2,100</u>	<u>250</u>	<u>40</u>	<u>290</u>	<u>40</u>	<u>270</u>	<u>310</u>
TOTAL			66,080	3,170	2,240	5,410	3,250	4,100	7,350

<sup>1</sup> Assumes 300 square feet per employee.

Source: Wilbur Smith Associates, March 24, 1988



Table 2-B

ESTIMATED TRIP GENERATION  
WITH THE TRIP REDUCTION PLAN  
-- HAMILTON FIELD MASTERPLAN

Novato U.S. 101/S.R. 37 PSR Traffic Study

<u>LAND USE</u>	<u>PM PEAK HOUR TRIP GENERATION EXTERNAL TO HAMILTON FIELD WITH REDUCTION</u>
Residential	1,505
Medical	328
Light Industrial/ Warehousing	591
Office/R&D	1,329
Retail/Hotel	463
TOTAL	<u>4,216</u>

Wilbur Smith Associates, March, 1988

Table 3  
TRIP GENERATION FOR OTHER CUMULATIVE GROWTH PROJECTS IN STUDY AREA  
U.S. 101/S.R. 37 PSR Traffic Study

PROJECT	TYPE OF DEVELOPMENT	SIZE OF DEVELOPMENT	DAILY TRIPS	MORNING PEAK HOUR TRIPS		EVENING PEAK HOUR TRIPS	
				Inbound	Outbound	Inbound	Outbound
Oakgrove	Apartments	119 d.u.	780	10	50	50	20
Posada West	Apartments	38 d.u.	250	5	20	20	10
Muirfield	Apartments	200 d.u.	1,040	15	70	150	60
Anderson-Rowe	Apartments	585 d.u.	3,860	60	230	230	120
	Office	156,000 sq. ft.	2,230	280	30	60	250
Pacheco Station	Condominium	196 d.u.	1,020	15	70	140	60
Indian Hills	Single Family Homes	20 d.u.	200	5	10	15	5
MCC Estates B	Single Family Homes	14 d.u.	140	5	10	10	5
Indian Valley College	College	3,000 students <sup>(1)</sup>	2,800	250	30	10	50
Marin County Club	Single Family Homes	60 d.u.	600	10	30	40	20
Villa Ignacio	Single Family Home	54 d.u.	540	10	30	30	20
Baytree Park	Single Family Home	24 d.u.	240	5	15	15	10
Hillside Park 3	Single Family Home	105 d.u.	1,050	20	60	70	40
Galli Square	Office	21,000 sq. ft.	300	40	5	10	30
	Restaurant	3,000 sq. ft.	490	20	20	20	10
Indian Valley	Condominiums	50 d.u.s	260	5	20	40	15
College	Increased Enrollment	2,000 people	2,000	170	20	30	10
Bel Marin Keys	Single Family Homes	800 units	8,000	170	440	500	300
TOTAL NEW TRIPS			25,000	1,095	1,160	1,440	1,035

(1) Indian Valley College was not holding classes while existing background counts were conducted.

SOURCE: Wilbur Smith Associates and the City of Novato, 1988.

### Trip Distribution - Hamilton Field

The distribution of workers and residents at the Hamilton Field site was based on the Environmental Impact Planning (EIP) estimates of where workers at the site would live. Based on the jobs/housing mix of the project and ABAG land use and employment projections, EIP developed the distribution shown in Table 4. This distribution of the workforce was the basis for the trip distribution assumptions shown in Table 5.

### Trip Distribution -- Other Nearby Novato

The same trip assignment which was utilized in the Ignacio Boulevard/Alameda del Prado Area Traffic Study was also used for other nearby Novato traffic generation in this study. The distribution assumptions for these trips are shown in Table 6. Because residential trips were not separated from retail trips, the freeway distribution shown in this table falls between the values used for Hamilton Field residential and Hamilton Field commercial land uses.

### Growth on U.S. 101

Projections '87 (ABAG, 1987) formed the basis of the through-traffic projections on U.S. 101. Because the forecasted increases in jobs far exceeds the number of employed residents in Sonoma County, a large number of the workers living in Sonoma County will commute out of the county. The number of employed residents and total jobs in Sonoma County for 1985 and year 2005 (the furthest ABAG projection year) are shown in Table 7. The growth in commuter travel outside of Sonoma County was estimated by assuming that daily commuters who commute out of the county would be equivalent to the number of employed residents minus the number of jobs in Sonoma County. Year 1985 statistics placed

Table 4

## RESIDENTIAL LOCATION OF HAMILTON FIELD WORKFORCE

Novato U.S. 101/S.R. 37 PSR Traffic Study

<u>LOCATION</u>	<u>PERCENT OF WORKERS</u>
On-Site Housing	16.2
Other Novato	11.0
South Marin	17.8
Subtotal Marin	45.0
San Francisco	8.0
Sonoma County	36.0
Napa/Vallejo	5.0
Richmond/Alameda County	
Other	6.0
Total Workforce	100.0

---

SOURCE: EIP Associates, 1987.

Table 5  
TRIP DISTRIBUTION - HAMILTON FIELD  
Novato U.S. 101/S.R. 37 PSR Traffic Study

<u>ORIGIN OR DESTINATION(1)</u>	<u>DISTRIBUTION OF WORKER TRIPS</u>	<u>DISTRIBUTION OF RESIDENTIAL TRIPS</u>
North of Novato	36.0	2.0
South of Novato	31.8	47.0
East of Novato (S.R. 37)	5.0	3.5
Other Novato	11.0	23.0
Internal to Hamilton Field	16.2	24.5
<b>TOTAL</b>	100.0	100.0

---

SOURCE: Wilbur Smith Associates, 1988.

(1) The same distribution percentage was applied to both inbound and outbound trips.



Table 6

TRIP DISTRIBUTION -- OTHER NEARBY NOVATO  
Novato U.S. 101/S.R. 37 PSR Traffic Study

<u>ORIGIN/DESTINATION OF TRIPS GENERATED IN STUDY AREA</u>	<u>PERCENT DISTRIBUTION</u>
Northern Segment of Highway 101	25
Southern Segment of Highway 101	35
Highway 37	10
Hamilton Field/East of Highway 101	14
Novato via Sunset Parkway/ Palmer Drive Extension	10
Internal Trips	<u>6</u>
TOTAL	100

Source: Wilbur Smith and Associates, 1986.

Table 7  
 ABAG PROJECTIONS FOR  
 GROWTH IN SONOMA COUNTY  
 Novato U.S. 101/S.R. 37 PSR Traffic Study

<u>YEAR</u>	<u>EMPLOYED RESIDENTS</u>	<u>JOBS</u>	<u>JOB DEFICIENCY</u> (employed residents minus jobs)
1985	156,800	119,900	36,900
2005	<u>245,800</u>	<u>190,500</u>	<u>55,300</u>
Increase	89,000	70,600	18,400
Percent Increase	57	59	50

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SOURCE: Projections '87, Association of Bay Area Governments,  
 1987.

this estimate at 36,900 commuters. Year 2005 forecasts indicate that the number of commuters will increase to 55,300, which is an increase of 50 percent over the Year 1985 estimated number of commuters. Because the number of jobs to the south of Sonoma County far outnumber employment opportunities to the north, most of these new commuter trips would be to Marin County or be passing through Marin County via U.S. 101. This approximation will under-estimate the actual number of daily commuters, but the relative increase in commuter travel should provide a reasonable estimate of the percentage increase in peak hour travel.

The actual number of commuters who travel south on Highway 101 during the peak hours may be approximated by multiplying the total number of commuters times factors representing:

1. The proportion of commuters who travel to or through Marin County;
2. The proportion of commuters who travel during the highest peak hour; and
3. The number of commuters who ride-share.

In this study, rather than developing each of these factors and then calibrating to existing vehicular flows, a single factor was developed which would account for all influences by assuming that the number of vehicles passing the county line during the peak hour is directly proportional to the total number of commuters.

The two southbound lanes on Highway 101 at the Marin/Sonoma county line operate at capacity during the morning peak hour. Accordingly, this hour the flow would be 1,800 to 2,000 vehicles per lane or 3,600 to 4,000 vehicles per hour for both lanes. The 1985 and 1986 peak hour ADT was reported by Caltrans to be 7,300

vehicles per hour in both directions, which is an average of 1,825 vehicles per lane. Because of the high directional split (the peak direction flow is approximately double the flow in the opposite direction), it is likely that the flow on this segment approaches the capacity of 2,000 vehicles per hour per lane.

The resulting demand factor would be  $4,000/36,900$ , or 0.11. Multiply the projected increase in commuters (18,400) by this factor yields a projected increase in demand of 2,000 vehicles per hour during the peak. A linear extrapolation to the Year 2010 results in a projected increase of 2,500 vehicles per hour during the peak, in the peak direction.

### Transit Capacity

In the transitway scenarios, it was assumed that the mode would be an exclusive busway. It was assumed that the service would run for the length of the NWPRR right-of-way between Larkspur and Highway 37, and the continue north into Sonoma County, serving the major residential areas in Petaluma and Santa Rosa. The capacity of a bus is 40 to 80 passengers, depending on the size of the buses and whether they are articulated. Headways were assumed to be 5 to 10 minutes during peak periods, which is equivalent to 6 to 12 buses per hour. Because of the projected magnitude of development at the Hamilton Field site, the highest frequency of service and capacity would likely be needed. At 5 minute headways, the system would have a capacity of 960 passengers per hour using 80 passenger articulated buses. In terms of the reduction of automobile trips, this would amount to the equivalent of 800 passenger cars, assuming an equivalent automobile occupancy of 1.2 persons per vehicle.

## Highway Capacity

Under ideal conditions, (daytime, clear weather conditions on flat, well designed highways without roadside obstructions, without truck or RV traffic or merging conflicts) the capacity of a highway is 2,000 vehicles per hour. (Highway Capacity Manual, Special Report 209, Transportation Research Board, 1985.) However, at flows of 2,000 vehicles per hour, speeds are typically slow (under 30 miles per hour) and the corresponding level of service is poor (E/F). In this study, the capacity of 1,800 vehicles per hour was assumed to be the design capacity. This corresponds to level of service D for level highways with 5 percent trucks. (Table 3-12, Highway Capacity Manual), This also assumes that adequate auxiliary lanes would be available at interchanges to accommodate merging traffic.

In this analysis it was assumed that Highway 101 would be built as an eight-lane freeway with auxiliary lanes as needed at interchanges. Accordingly the design capacity of Highway 101 in the study area was assumed to be 7,200 vehicles per hour in each direction.

## McInnis Parkway Capacity

The capacity of the parkway was limited to 1,500 vehicles per hour in each direction (or 750 vehicles per lane per hour) because of assumed restrictions at roadway junctions. This capacity represents a volume capacity ratio of 0.80 at signalized intersections, if all conflicting movements with the through traffic on McInnis Parkway total 370 vehicles per hour per lane.



## PROJECTIONS

Traffic flows for each scenario and each alternative were assigned to the Highway 101 interchanges at Alameda del Prado, Ignacio Boulevard, and Highway 37. These assignments are presented in the appendix of this report. The Highway 37 projections are shown as origin-destination matrices. The appendix also contains a printout of the traffic assignments on local streets. In this section, screen line traffic volumes are shown at a cut just to the south of the State Road 37 interchange and levels of service as calculated.

### Screenline Analysis

In order to present traffic flows as they are distributed among the various alternative routes and modes, a screenline was drawn at a section south of Highway 37. Tables 8 to 11 show the results of this analysis without the TSM program at Hamilton Field. Tables 12 to 15 show the results with the TSM program at Hamilton Field.

### Levels of Service

Intersection levels of service were calculated assuming the geometry of Alternate G. The lane configurations assumed for these calculations correspond to the geometrics developed in association with Korve Engineering, as presented in the March 23, 1988 40-scale submittal by Korve Engineering Year 2010 geometrics vary slightly from year 1997 geometrics between the new north-bound on-ramp on Nave Drive and Ignacio Boulevard. This modification was needed to accommodate Year 2010 traffic volumes with TSM but with neither the transitway nor the parkway. The results of these calculations are shown in Tables 16 to 19 for

TABLE 8  
AM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 1997  
Novato Highway 101/37 PRS Traffic Study

AM PEAK HOUR TRAFFIC VOLUMES IN SOUTHBOUND DIRECTION									
IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	HAMILTON FIELD PROJECT	OTHER CUMULATIVE GROWTH	EXISTING	SUB-TOTAL	TOTAL	CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
1. Without Mc Innis Without Transitway	Highway 101	1,396	1,427	6,000	8,823	8,823	8,100	8,100	(723)
2. With Mc Innis Without Transitway	Highway 101	778	1,285	5,100	7,163		8,100		
	Mc Innis Pkwy	618	143	900	1,661	8,823	1,500	9,600	777
3. Without Mc Innis With Transitway	Highway 101	1,230	1,268	5,686	8,184		8,100		
	Transitway	166	160	314	640	8,823	960	9,060	237
4. With Mc Innis With Transitway	Highway 101	722	1,178	4,904	6,804		8,100		
	Mc Innis Pkwy	508	143	900	1,551		1,500		
	Transitway	165	107	197	469	8,823	960	10,560	1,737

Notes:

- (1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.  
Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.  
The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

TABLE 9  
PM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 1997  
Novato Highway 101/37 PRS Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRING DEMAND	PM PEAK HOUR TRAFFIC VOLUMES IN NORTHBOUND DIRECTION							
		HAMILTON FIELD PROJECT	OTHER CUMULATIVE GROWTH	EXISTING	SUB-TOTAL	TOTAL	CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
1. Without Mc Innis Without Transitway	Highway 101	1,699	1,088	6,700	9,487	9,487	8,100	8,100	(1,387)
2. With Mc Innis Without Transitway	Highway 101	971	979	5,960	7,910		8,100		
	Mc Innis Pkwy	728	110	740	1,578	9,488	1,500	9,600	112
3. Without Mc Innis With Transitway	Highway 101	1,492	959	6,276	8,727		8,100		
	Transitway	208	129	424	761	9,488	960	9,060	(428)
4. With Mc Innis With Transitway	Highway 101	902	882	5,430	7,214		8,100		
	Mc Innis Pkwy	590	120	1,005	1,715		1,500		
	Transitway	208	86	265	559	9,488	960	10,560	1,072

Notes:

(1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.

Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.

The transit would run buses at 5 to 10 minute headways with a capcity of 40 to 80 passengers per bus.

TABLE 10  
AM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 2010  
Novato Highway 101/37 PRS Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	AM PEAK HOUR TRAFFIC VOLUMES IN SOUTHBOUND DIRECTION							
		HAMILTON FIELD PROJECT	OTHER CUMULATIVE GROWTH	EXISTING	SUB-TOTAL	TOTAL	CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
1. Without Mc Innis Without Transitway	Highway 101	1,396	3,280	6,000	10,676	10,676	8,100	8,100	(2,576)
2. With Mc Innis Without Transitway	Highway 101	778	2,952	5,100	8,830		8,100		
	Mc Innis Pkwy	618	328	900	1,846	10,676	1,500	9,600	(1,076)
3. Without Mc Innis With Transitway	Highway 101	1,230	2,913	5,686	9,829		8,100		
	Transitway	166	367	314	847	10,676	960	9,060	(1,616)
4. With Mc Innis With Transitway	Highway 101	722	2,707	4,904	8,333		8,100		
	Mc Innis Pkwy	508	328	900	1,736		1,500		
	Transitway	165	245	197	607	10,676	960	10,560	(116)

Notes:

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- (1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.  
Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.  
The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

Wilbur Smith Associates, April 20, 1987

TABLE 11  
PM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 2010  
Novato Highway 101/37 PSR Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	PM PEAK HOUR TRAFFIC VOLUMES IN NORTHBOUND DIRECTION							
		HAMILTON FIELD PROJECT	OTHER CUMULATIVE GROWTH	EXISTING	SUB-TOTAL	TOTAL	CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
1. Without Mc Innis Without Transitway	Highway 101	1,699	2,500	6,700	10,899	10,899	8,100	8,100	(2,799)
2. With Mc Innis Without Transitway	Highway 101	971	2,250	5,960	9,181		8,100		
	Mc Innis Pkwy	728	250	740	1,718	10,899	1,500	9,600	(1,299)
3. Without Mc Innis With Transitway	Highway 101	1,492	2,203	6,276	9,970		8,100		
	Transitway	208	297	424	929	10,899	960	9,060	(1,839)
4. With Mc Innis With Transitway	Highway 101	902	2,026	5,430	8,358		8,100		
	Mc Innis Pkwy	590	275	1,005	1,870		1,500		
	Transitway	208	198	265	671	10,899	960	10,560	(339)

Notes:

- (1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.  
Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.  
The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.



TABLE 12  
AM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 1997  
Novato Highway 101/37 PRS Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	AM PEAK HOUR TRAFFIC VOLUMES IN SOUTHBOUND DIRECTION				TOTAL CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
		HAMILTON FIELD PROJECT	OTHER CUMULATIVE GROWTH	EXISTING	SUB-TOTAL			
1. Without Mc Innis Without Transitway	Highway 101	1,326	1,427	6,000	8,754	8,754	8,100	(654)
2. With Mc Innis Without Transitway	Highway 101	739	1,285	5,100	7,124		8,100	
	Mc Innis Pkwy	587	143	900	1,630	8,754	1,500	846
3. Without Mc Innis With Transitway	Highway 101	1,169	1,268	5,686	8,122		8,100	
	Transitway	158	160	314	631	8,754	960	306
4. With Mc Innis With Transitway	Highway 101	686	1,178	4,904	6,768		8,100	
	Mc Innis Pkwy	483	143	900	1,525		1,500	
	Transitway	157	107	197	460	8,754	960	1,806

Notes:

- (1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.  
Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.  
The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

Wilbur Smith Associates, April 20, 1987

TABLE 13  
PM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 1997  
Novato Highway 101/37 PRS Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	PM PEAK HOUR TRAFFIC VOLUMES IN NORTHBOUND DIRECTION				TOTAL CAPACITY	TOTAL CAPACITY	SURPLUS CAPACITY (DEFICIENCY)
		HAMILTON FIELD PROJECT	OTHER CUMULATIVE GROWTH	EXISTING	SUB-TOTAL			
1. Without Mc Innis Without Transitway	Highway 101	1,614	1,088	6,700	9,402	9,402	8,100	8,100 (1,302)
2. With Mc Innis Without Transitway	Highway 101	922	979	5,960	7,862		8,100	
	Mc Innis Pkwy	692	110	740	1,542	9,403	1,500	9,600 197
3. Without Mc Innis With Transitway	Highway 101	1,417	959	6,276	8,652		8,100	
	Transitway	198	129	424	751	9,403	960	9,060 (343)
4. With Mc Innis With Transitway	Highway 101	857	882	5,430	7,169		8,100	
	Mc Innis Pkwy	561	120	1,005	1,685		1,500	
	Transitway	198	86	265	549	9,403	960	10,560 1,157

Notes:

(1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.

Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.

The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

TABLE 14  
AM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 2010  
Novato Highway 101/37 PRS Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	AM PEAK HOUR TRAFFIC VOLUMES IN SOUTHBOUND DIRECTION							
		HAMILTON PROJECT	OTHER FIELD CUMULATIVE GROWTH	EXISTING	SUB-TOTAL	TOTAL	CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
1. Without Mc Innis Without Transitway	Highway 101	1,326	3,280	6,000	10,606	10,606	8,100	8,100	(2,506)
2. With Mc Innis Without Transitway	Highway 101	739	2,952	5,100	8,791		8,100		
	Mc Innis Pkwy	587	328	900	1,815	10,606	1,500	9,600	(1,006)
3. Without Mc Innis With Transitway	Highway 101	1,169	2,913	5,686	9,768		8,100		
	Transitway	158	367	314	839	10,606	960	9,060	(1,546)
4. With Mc Innis With Transitway	Highway 101	686	2,707	4,904	8,297		8,100		
	Mc Innis Pkwy	483	328	900	1,711		1,500		
	Transitway	157	245	197	599	10,606	960	10,560	(46)

Notes:

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- (1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.  
Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.  
The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

Wilbur Smith Associates, April 20, 1987

TABLE 15  
PM PEAK HOUR  
TRAFFIC DISTRIBUTION  
AT A SCREEN-LINE SOUTH OF HIGHWAY 37  
YEAR 2010  
Novato Higway 101/37 PSR Traffic Study

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	PM PEAK HOUR TRAFFIC VOLUMES IN NORTHBOUND DIRECTION							
		HAMILTON PROJECT	OTHER FIELD CUMULATIVE GROWTH	EXISTING	SUB-TOTAL	TOTAL	CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
1. Without Mc Innis Without Transitway	Highway 101	1,614	2,500	6,700	10,814	10,814	8,100	8,100	(2,714)
2. With Mc Innis Without Transitway	Highway 101	922	2,250	5,960	9,132		8,100		
	Mc Innis Pkwy	692	250	740	1,682	10,814	1,500	9,600	(1,214)
3. Without Mc Innis With Transitway	Highway 101	1,417	2,203	6,276	9,895		8,100		
	Transitway	198	297	424	919	10,814	960	9,060	(1,754)
4. With Mc Innis With Transitway	Highway 101	857	2,026	5,430	8,313		8,100		
	Mc Innis Pkwy	561	275	1,005	1,841		1,500		
	Transitway	198	198	265	661	10,814	960	10,560	(254)

Notes:

- (1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.  
Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.  
The transit would run buses at 5 to 10 minute headways with a capcity of 40 to 80 passengers per bus.

Table 16

INTERSECTION LEVELS OF SERVICE  
 ALTERNATE G -- AM PEAK HOUR -- YEAR 1997  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	A	0.55	A	0.41	A	0.48	A	0.37
Nave Drive/ State Access Road	D	0.81	A	0.59	C	0.70	A	0.55
Nave Drive/ Main Gate Road	C	0.77	A	0.58	B	0.67	A	0.54
Nave -- South NB 101 Ramps	A	0.55	A	0.42	A	0.48	A	0.39
Alameda Del Prado/ Clay Court	B	0.61	A	0.52	A	0.55	A	0.48
Alameda Del Prado/ SB HWY 101 Ramps	D	0.87	B	0.68	C	0.76	B	0.63
SB HWY 101 Ramps/ Ignacio Boulevard	C	0.76	A	0.48	A	0.54	A	0.43
Nave Drive/101 NB/ Ignacio Boulevard	D	0.89	B	0.68	D	0.83	B	0.62
Nave Drive/ NB 101 Off-Ramp	D	0.89	B	0.68	D	0.83	B	0.62
Nave Drive/ Bolling	B	0.64	A	0.51	A	0.56	A	0.47

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Wilbur Smith Associates, April 22, 1988.



Table 17

INTERSECTION LEVELS OF SERVICE  
 ALTERNATE G -- PM PEAK HOUR -- YEAR 1997  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	D	0.87	B	0.62	C	0.75	A	0.57
Nave Drive/ State Access Road	C	0.79	A	0.59	B	0.68	A	0.55
Nave Drive/ Main Gate Road	D	0.83	B	0.63	C	0.72	A	0.59
Nave -- South NB 101 Ramps	C	0.78	B	0.66	B	0.69	B	0.61
Alameda Del Prado/ Clay Court	C	0.73	B	0.64	B	0.68	B	0.60
Alameda Del Prado/ SB HWY 101 Ramps	E	0.93	B	0.68	D	0.80	B	0.63
SB HWY 101 Ramps/ Ignacio Boulevard	B	0.66	A	0.47	A	0.56	A	0.43
Nave Drive/101 NB/ Ignacio Boulevard	D	0.89	C	0.70	D	0.85	B	0.64
Nave Drive/ NB 101 Off-Ramp	D	0.89	C	0.70	D	0.85	B	0.64
Nave Drive/ Bolling	C	0.70	A	0.54	B	0.61	A	0.50

Wilbur Smith Associates, April 22, 1988.

Table 18

INTERSECTION LEVELS OF SERVICE  
 ALTERNATE G -- AM PEAK HOUR -- YEAR 2010  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	A	0.56	A	0.41	A	0.49	A	0.38
Nave Drive/ State Access Road	D	0.83	B	0.61	C	0.72	A	0.56
Nave Drive/ Main Gate Road	C	0.79	C	0.60	B	0.68	A	0.55
Nave -- South NB 101 Ramps	A	0.57	A	0.43	A	0.49	A	0.40
Alameda Del Prado/ Clay Court	B	0.65	A	0.56	A	0.58	A	0.51
Alameda Del Prado/ SB HWY 101 Ramps	E	0.90	C	0.70	C	0.79	B	0.65
SB HWY 101 Ramps/ Ignacio Boulevard	D	0.82	B	0.68	C	0.73	B	0.62
Nave Drive/101 NB/ Ignacio Boulevard <sup>(1)</sup>	D	0.88	C	0.70	D	0.83	B	0.63
Nave Drive/ NB 101 Off-Ramp <sup>(2)</sup>	D	0.88	C	0.70	D	0.83	B	0.63
Nave Drive/ Bolling	B	0.68	A	0.54	A	0.59	A	0.50

Wilbur Smith Associates, April 22, 1988.

(1) Assumes additional northbound approach lane.

(2) Assumes additional southbound right-turn lane.

Table 19

INTERSECTION LEVELS OF SERVICE  
 ALTERNATE G -- PM PEAK HOUR -- YEAR 2010  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	E	0.92	B	0.67	D	0.80	B	0.62
Nave Drive/ State Access Road	D	0.84	B	0.65	C	0.73	B	0.60
Nave Drive/ Main Gate Road	D	0.88	B	0.69	C	0.76	B	0.64
Nave -- South NB 101 Ramps	D	0.81	B	0.69	C	0.72	B	0.64
Alameda Del Prado/ Clay Court	D	0.81	B	0.69	C	0.72	B	0.64
Alameda Del Prado/ SB HWY 101 Ramps	E	0.95	C	0.70	D	0.82	B	0.65
SB HWY 101 Ramps/ Ignacio Boulevard	C	0.74	B	0.65	B	0.68	A	0.59
Nave Drive/101 NB/ Ignacio Boulevard <sup>(1)</sup>	E	0.93	C	0.72	D	0.84	B	0.66
Nave Drive/ NB 101 Off-Ramp <sup>(2)</sup>	E	0.93	C	0.72	D	0.84	B	0.66
Nave Drive/ Bolling	C	0.72	A	0.56	B	0.63	A	0.52

Wilbur Smith Associates, April 21, 1988.

(1) Assumes additional northbound approach lane.

(2) Assumes additional southbound right-turn lane.

the analysis without TSM, and Tables 20 to 23 for the analysis with TSM program at Hamilton Field.

Table 20

INTERSECTION LEVELS OF SERVICE WITH TSM  
 ALTERNATE G -- AM PEAK HOUR -- YEAR 1997  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	A	0.48	A	0.37	A	0.46	A	0.35
Nave Drive/ State Access Road	C	0.72	B	0.68	B	0.68	A	0.50
Nave Drive/ Main Gate Road	B	0.68	A	0.52	B	0.64	A	0.49
Nave -- South NB 101 Ramps	A	0.49	A	0.37	A	0.46	A	0.35
Alameda Del Prado/ Clay Court	A	0.58	A	0.49	A	0.52	A	0.46
Alameda Del Prado/ SB HWY 101 Ramps	D	0.83	B	0.65	C	0.72	B	0.60
SB HWY 101 Ramps/ Ignacio Boulevard	C	0.72	A	0.48	A	0.51	A	0.41
Nave Drive/101 NB Ignacio Boulevard	D	0.88	B	0.65	D	0.82	B	0.60
Nave Drive/ NB 101 Off-Ramp	D	0.88	B	0.65	D	0.82	B	0.60
Nave Drive/ Bolling	A	0.58	A	0.46	A	0.54	A	0.43

Wilbur Smith Associates, April 21, 1988.



Table 21

INTERSECTION LEVELS OF SERVICE WITH TSM  
 ALTERNATE G -- PM PEAK HOUR -- YEAR 1997  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	D	0.85	B	0.60	C	0.80	A	0.57
Nave Drive/ State Access Road	C	0.76	A	0.57	C	0.71	A	0.53
Nave Drive/ Main Gate Road	C	0.78	B	0.61	C	0.74	A	0.57
Nave -- South NB 101 Ramps	C	0.74	B	0.63	B	0.69	A	0.59
Alameda Del Prado/ Clay Court	B	0.69	B	0.61	C	0.76	A	0.57
Alameda Del Prado/ SB HWY 101 Ramps	D	0.88	B	0.65	A	0.53	B	0.60
SB HWY 101 Ramps/ Ignacio Boulevard	B	0.63	A	0.45	C	0.77	A	0.41
Nave Drive/101 NB Ignacio Boulevard	D	0.88	B	0.68	D	0.84	B	0.63
Nave Drive/ NB 101 Off-Ramp	D	0.88	B	0.68	D	0.84	B	0.63
Nave Drive/ Bolling	B	0.68	A	0.53	B	0.64	A	0.50

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Wilbur Smith Associates, April 21, 1988.

Table 22

INTERSECTION LEVELS OF SERVICE WITH TSM  
 ALTERNATE G -- AM PEAK HOUR -- YEAR 2010  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	A	0.50	A	0.38	A	0.47	A	0.36
Nave Drive/ State Access Road	C	0.73	A	0.54	B	0.69	A	0.51
Nave Drive/ Main Gate Road	B	0.69	A	0.53	B	0.65	A	0.50
Nave -- South NB 101 Ramps	A	0.50	A	0.38	A	0.47	A	0.36
Alameda Del Prado/ Clay Court	B	0.62	A	0.53	A	0.55	A	0.48
Alameda Del Prado/ SB HWY 101 Ramps	D	0.86	B	0.67	C	0.75	B	0.62
SB HWY 101 Ramps/ Ignacio Boulevard	C	0.78	B	0.65	B	0.69	A	0.59
Nave Drive/101 NB Ignacio Boulevard <sup>(1)</sup>	D	0.87	B	0.68	D	0.83	B	0.62
Nave Drive/ NB 101 Off-Ramp <sup>(2)</sup>	D	0.87	B	0.68	D	0.83	B	0.62
Nave Drive/ Bolling	B	0.61	A	0.50	A	0.57	A	0.47

Wilbur Smith Associates, April 21, 1988.

(1) Assumes additional northbound approach lane.

(2) Assumes additional southbound right-turn lane.

Table 23

INTERSECTION LEVELS OF SERVICE WITH TSM  
 ALTERNATE G -- PM PEAK HOUR -- YEAR 2010  
 HWY 101/S.R. 37 PSR Traffic Study

INTERSECTION	PARKWAY/TRANSITWAY ALTERNATIVE							
	WITH NEITHER		McINNIS		TRANSIT WAY		WITH BOTH	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
Nave Drive/ New Entrance Road	D	0.89	B	0.66	C	0.79	B	0.62
Nave Drive/ State Access Road	D	0.81	B	0.62	C	0.70	A	0.58
Nave Drive/ Main Gate Road	D	0.84	B	0.66	C	0.79	B	0.62
Nave -- South NB 101 Ramps	C	0.78	B	0.67	C	0.73	B	0.63
Alameda Del Prado/ Clay Court	C	0.77	B	0.66	B	0.68	B	0.61
Alameda Del Prado/ SB HWY 101 Ramps	D	0.89	B	0.67	C	0.78	B	0.62
SB HWY 101 Ramps/ Ignacio Boulevard	C	0.70	B	0.62	B	0.65	A	0.56
Nave Drive/101 NB Ignacio Boulevard <sup>(1)</sup>	D	0.89	B	0.68	D	0.83	B	0.62
Nave Drive/ NB 101 Off-Ramp <sup>(2)</sup>	D	0.89	B	0.68	D	0.83	B	0.62
Nave Drive/ Bolling	C	0.70	A	0.54	B	0.66	A	0.51

Wilbur Smith Associates, April 21, 1988.

(1) Assumes additional northbound approach lane.

(2) Assumes additional southbound right-turn lane.

# APPENDIX

**HWY 101/S.R. 37**  
**ORIGIN/DESTINATION**  
**MATRICES**

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	2160	100	240	0	0	0	0	2500
HWY 101 - NORTH	3930	0	30	40	0	0	0	0	4000
S. NOVATO BL WEST	970	120	0	40	0	0	0	0	1130
SR 37 EAST	1100	50	50	0	0	0	0	0	1200
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	6000	2330	180	320	0	0	0	0	0

## AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	5300	400	1000	0	0	0	0	6700
HWY 101 - NORTH	2450	0	60	90	0	0	0	0	2600
S. NOVATO BL WEST	200	40	0	50	0	0	0	0	290
SR 37 EAST	550	30	50	0	0	0	0	0	630
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	3200	5370	510	1140	0	0	0	0	0

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
1987 AM & PM PEAK HOUR DEMANDS

Novato U.S. 101/SR 37 PSR Traffic Study



TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	3386	216	368	0	0	0	0	3970
HWY 101 - NORTH	6107	0	39	53	0	0	0	0	6198
S. NOVATO BL WEST	1293	133	0	49	0	0	0	0	1474
SR 37 EAST	1424	59	63	0	0	0	0	0	1545
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	8823	3578	318	470	0	0	0	0	0

## AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	7549	638	1300	0	0	0	0	9487
HWY 101 - NORTH	3898	0	73	94	0	0	0	0	4065
S. NOVATO BL WEST	351	49	0	59	0	0	0	0	459
SR 37 EAST	740	34	54	0	0	0	0	0	828
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	4988	7632	766	1453	0	0	0	0	0

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 1997 AM & PM PEAK HOUR DEMANDS

Novato U.S. 101/SR 37 PSR Traffic Study

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	3996	244	436	0	0	0	0	4677
HWY 101 - NORTH	7491	0	50	70	0	0	0	0	7611
S. NOVATO BL WEST	1519	150	0	60	0	0	0	0	1729
SR 37 EAST	1667	70	80	0	0	0	0	0	1817
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	10676	4216	374	566	0	0	0	0	

### AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	8667	723	1509	0	0	0	0	10899
HWY 101 - NORTH	4564	0	90	100	0	0	0	0	4754
S. NOVATO BL WEST	396	60	0	70	0	0	0	0	526
SR 37 EAST	864	40	60	0	0	0	0	0	964
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	5825	8767	873	1679	0	0	0	0	

### PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 2010 AM & PM PEAK HOUR DEMANDS

Novato U.S. 101/SR 37 PSR Traffic Study

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	2788	105	251	0	0	0	0	3144
HWY 101 - NORTH	5077	0	33	46	671	0	0	0	5827
S. NOVATO BL WEST	981	114	0	49	312	19	0	0	1474
SR 37 EAST	1103	50	63	0	320	8	0	0	1545
McINNIS PKWY SOUTH	0	367	112	117	0	230	0	0	826
McINNIS PKWY NORTH	0	0	5	7	359	0	0	0	371
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	7162	3319	318	470	1662	258	0	0	0

## AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	6516	399	995	0	0	0	0	7910
HWY 101 - NORTH	3321	0	63	80	397	0	0	0	3861
S. NOVATO BL WEST	201	42	0	59	150	7	0	0	459
SR 37 EAST	554	29	54	0	186	5	0	0	828
McINNIS PKWY SOUTH	0	631	240	305	0	402	0	0	1578
McINNIS PKWY NORTH	0	0	10	14	180	0	0	0	204
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	4076	7218	766	1453	912	414	0	0	0

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 1997 AM & PM PEAK HOUR DEMANDS  
WITH McINNIS PARKWAY

Novato U.S. 101/SR 37 PSR Traffic Study



TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	3337	130	312	0	0	0	0	3779
HWY 101 - NORTH	6323	0	44	61	671	0	0	0	7099
S. NOVATO BL WEST	1185	129	0	60	334	21	0	0	1729
SR 37 EAST	1322	61	80	0	345	10	0	0	1817
McINNIS PKWY SOUTH	0	367	114	124	0	291	0	0	896
McINNIS PKWY NORTH	0	0	7	9	497	0	0	0	513
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	8830	3894	374	566	1847	322	0	0	0

## AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	7523	475	1183	0	0	0	0	9181
HWY 101 - NORTH	3921	0	78	86	397	0	0	0	4482
S. NOVATO BL WEST	242	52	0	70	154	8	0	0	526
SR 37 EAST	666	35	60	0	198	6	0	0	964
McINNIS PKWY SOUTH	0	631	248	326	0	514	0	0	1719
McINNIS PKWY NORTH	0	0	12	15	246	0	0	0	273
TRANSITWAY SOUTH	0	0	0	0	0	0	0	0	0
TRANSITWAY NORTH	0	0	0	0	0	0	0	0	0
TOTAL	4829	8240	873	1679	996	527	0	0	0

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 2010 AM & PM PEAK HOUR DEMANDS  
WITH McINNIS PARKWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	3029	216	368	0	0	0	0	3614
HWY 101 - NORTH	5466	0	39	53	0	0	0	0	5557
S. NOVATO BL WEST	1293	133	0	49	0	0	0	0	1474
SR 37 EAST	1424	59	63	0	0	0	0	0	1545
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	357	357
TRANSITWAY NORTH	0	0	0	0	0	0	641	0	641
TOTAL	8182	3221	318	470	0	0	641	357	0

## AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	6788	638	1300	0	0	0	0	8726
HWY 101 - NORTH	3485	0	73	94	0	0	0	0	3652
S. NOVATO BL WEST	351	49	0	59	0	0	0	0	459
SR 37 EAST	740	34	54	0	0	0	0	0	828
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	761	761
TRANSITWAY NORTH	0	0	0	0	0	0	413	0	413
TOTAL	4575	6871	766	1453	0	0	413	761	0

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 1997 AM & PM PEAK HOUR DEMANDS  
WITH TRANSITWAY

Novato U.S. 101/SR 37 PSR Traffic Study

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	3548	244	436	0	0	0	0	4228
HWY 101 - NORTH	6642	0	50	70	0	0	0	0	6762
S. NOVATO BL WEST	1519	150	0	60	0	0	0	0	1729
SR 37 EAST	1667	70	80	0	0	0	0	0	1817
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	448	448
TRANSITWAY NORTH	0	0	0	0	0	0	849	0	849
TOTAL	9827	3768	374	566	0	0	849	448	0

## AM PEAK

TO FROM	HWY 101 - SOUTH	HWY 101 - NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101 - SOUTH	0	7739	723	1509	0	0	0	0	9971
HWY 101 - NORTH	4051	0	90	100	0	0	0	0	4241
S. NOVATO BL WEST	396	60	0	70	0	0	0	0	526
SR 37 EAST	864	40	60	0	0	0	0	0	964
McINNIS PKWY SOUTH	0	0	0	0	0	0	0	0	0
McINNIS PKWY NORTH	0	0	0	0	0	0	0	0	0
TRANSITWAY SOUTH	0	0	0	0	0	0	0	929	929
TRANSITWAY NORTH	0	0	0	0	0	0	513	0	513
TOTAL	5311	7839	873	1679	0	0	513	929	0

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 2010 AM & PM PEAK HOUR DEMANDS  
WITH TRANSITWAY

Novato U.S. 101/SR 37 PSR Traffic Study



TO FROM	HWY 101-SOUTH	HWY 101-NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101-SOUTH	0	2596	105	251	0	0	0	0	2951
HWY 101-NORTH	4719	0	33	46	578	0	0	0	5376
S. NOVATO BL WEST	981	114	0	49	312	19	0	0	1474
SR 37 EAST	1103	50	63	0	320	8	0	0	1545
McINNIS PKWY SOUTH	0	317	112	117	0	205	0	0	751
McINNIS PKWY NORTH	0	0	5	7	340	0	0	0	353
TRANSITWAY SOUTH	0	0	0	0	0	0	0	268	268
TRANSITWAY NORTH	0	0	0	0	0	0	470	0	470
TOTAL	6803	3077	318	470	1551	233	470	268	0

## AM PEAK

TO FROM	HWY 101-SOUTH	HWY 101-NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101-SOUTH	0	5831	395	987	0	0	0	0	7214
HWY 101-NORTH	2978	0	62	80	0	0	0	0	3120
S. NOVATO BL WEST	200	41	0	59	152	7	0	0	459
SR 37 EAST	549	29	54	0	191	5	0	0	828
McINNIS PKWY SOUTH	0	715	243	313	0	444	0	0	1715
McINNIS PKWY NORTH	0	0	11	14	236	0	0	0	631
TRANSITWAY SOUTH	0	0	0	0	0	0	0	559	559
TRANSITWAY NORTH	0	0	0	0	0	0	314	0	314
TOTAL	3726	6987	766	1453	578	456	314	559	

## PM PEAK



HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 1997 AM & PM PEAK HOUR DEMANDS  
WITH McINNIS PARKWAY AND TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

TO FROM	HWY 101-SOUTH	HWY 101-NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101-SOUTH	0	3084	130	312	0	0	0	0	3526
HWY 101-NORTH	5826	0	44	61	578	0	0	0	6509
S. NOVATO BL WEST	1185	129	0	60	334	21	0	0	1729
SR 37 EAST	1322	61	80	0	345	10	0	0	1817
McINNIS PKWY SOUTH	0	317	114	124	0	266	0	0	822
McINNIS PKWY NORTH	0	0	7	9	479	0	0	0	494
TRANSITWAY SOUTH	0	0	0	0	0	0	0	329	329
TRANSITWAY NORTH	0	0	0	0	0	0	608	0	608
TOTAL	8333	3590	374	566	1736	297	608	329	

## AM PEAK

TO FROM	HWY 101-SOUTH	HWY 101-NORTH	S. NOVATO BL WEST	SR 37 EAST	McINNIS PKWY SOUTH	McINNIS PKWY NORTH	TRANSITWAY SOUTH	TRANSITWAY NORTH	TOTAL
HWY 101-SOUTH	0	6726	468	1165	0	0	0	0	8358
HWY 101-NORTH	3511	0	77	85	0	0	0	0	3673
S. NOVATO BL WEST	238	51	0	70	158	9	0	0	526
SR 37 EAST	655	34	60	0	209	6	0	0	964
McINNIS PKWY SOUTH	0	715	256	344	0	556	0	0	1871
McINNIS PKWY NORTH	0	0	14	15	303	0	0	0	701
TRANSITWAY SOUTH	0	0	0	0	0	0	0	671	671
TRANSITWAY NORTH	0	0	0	0	0	0	381	0	381
TOTAL	4404	7896	873	1679	671	571	381	671	

## PM PEAK

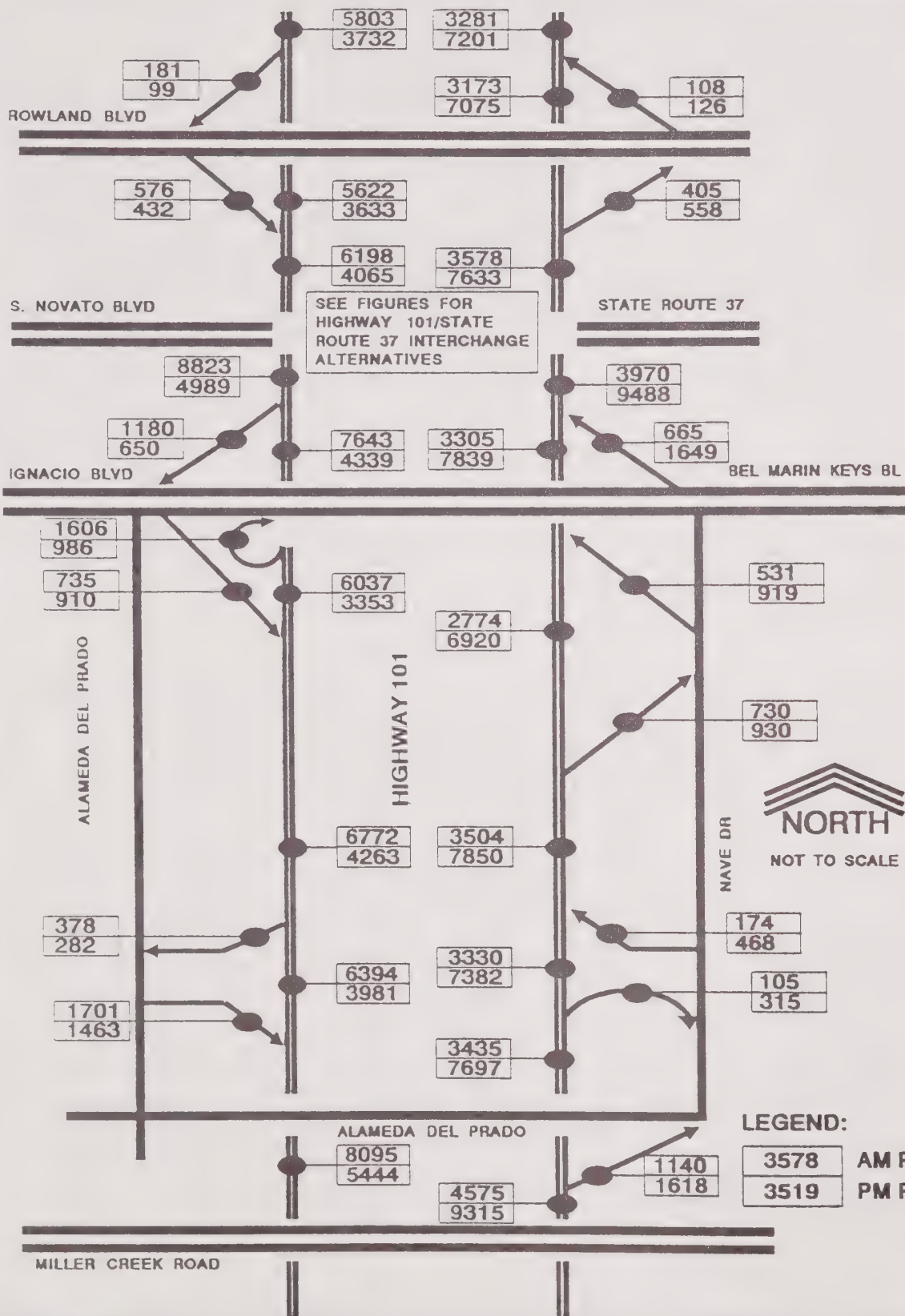


HIGHWAY 37/101 INTERCHANGE O/D MATRIX  
YEAR 2010 AM & PM PEAK HOUR DEMANDS  
WITH McINNIS PARKWAY AND TRANSITWAY

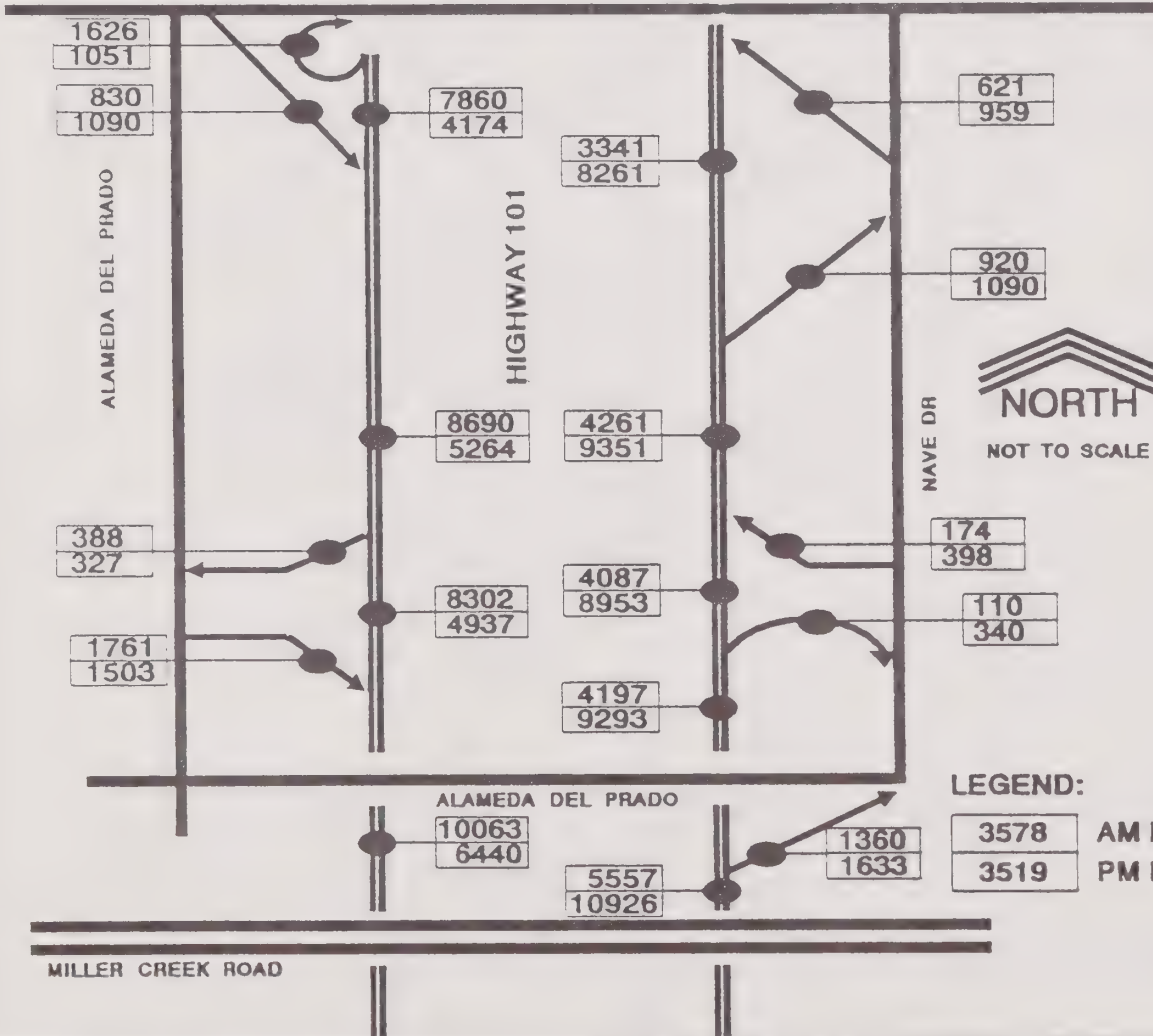
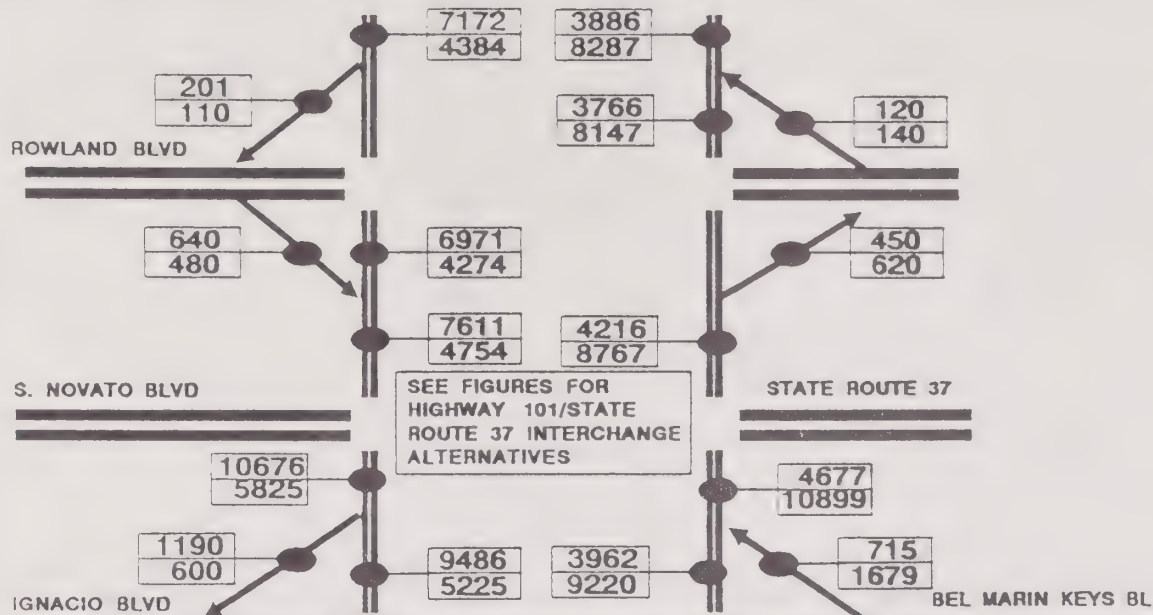
Novato U.S. 101/SR 37 PSR Traffic Study

**HWY 101  
PEAK HOUR MAINLINE  
AND RAMP TRAFFIC  
FLOW PROJECTIONS**

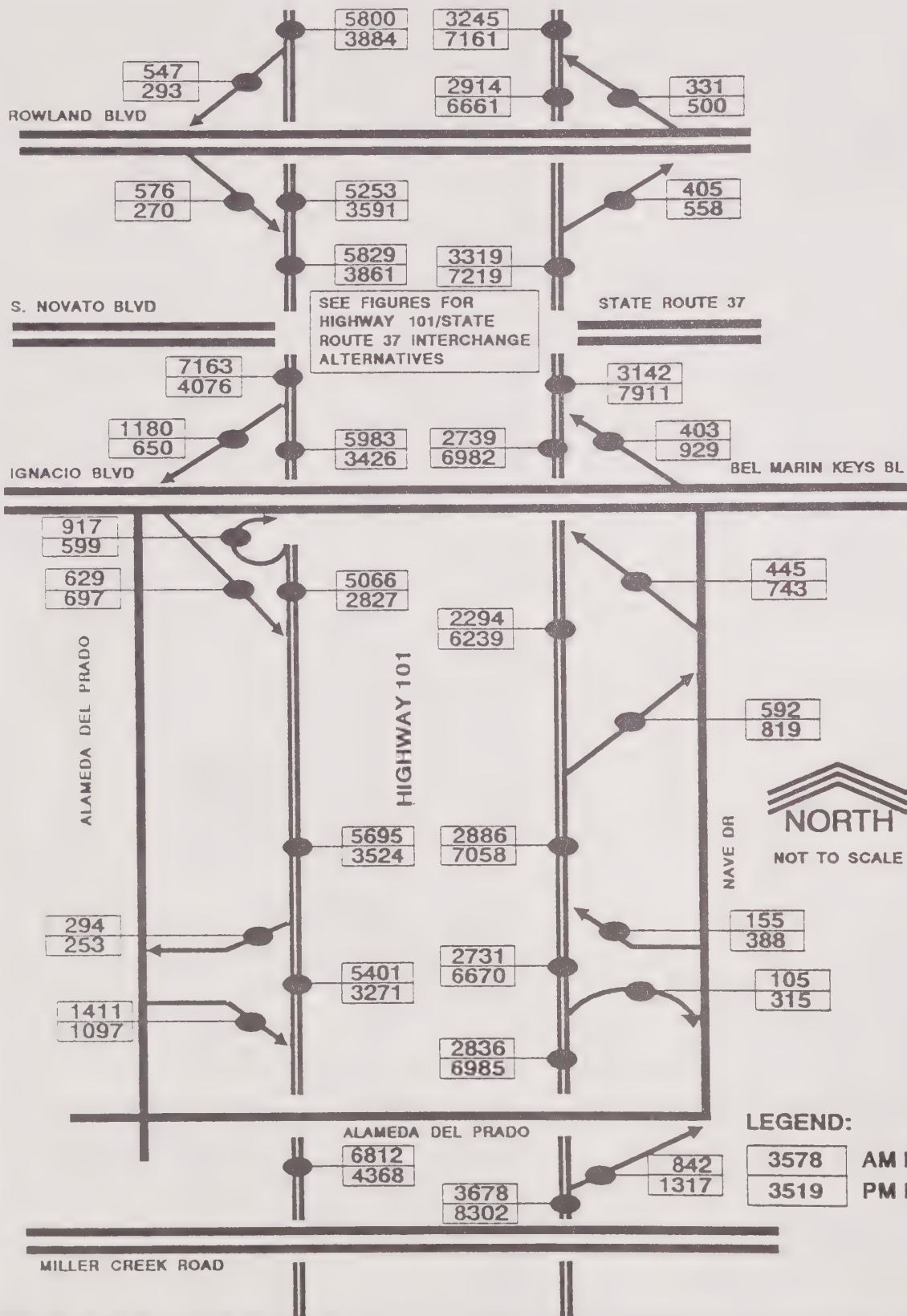




YEAR 1997 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITHOUT McINNIS PARKWAY AND TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

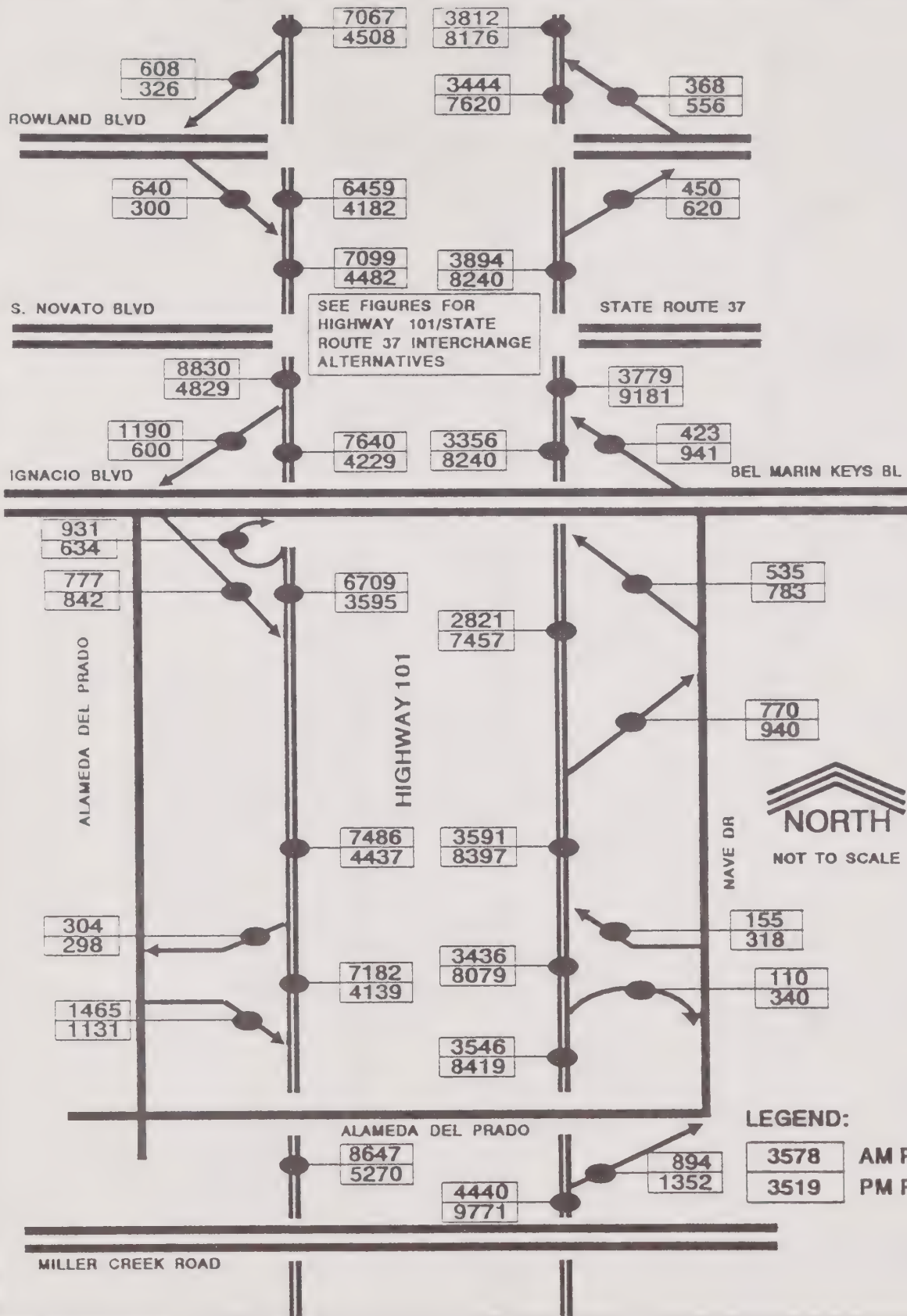


YEAR 2010 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITHOUT McINNIS PARKWAY AND TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

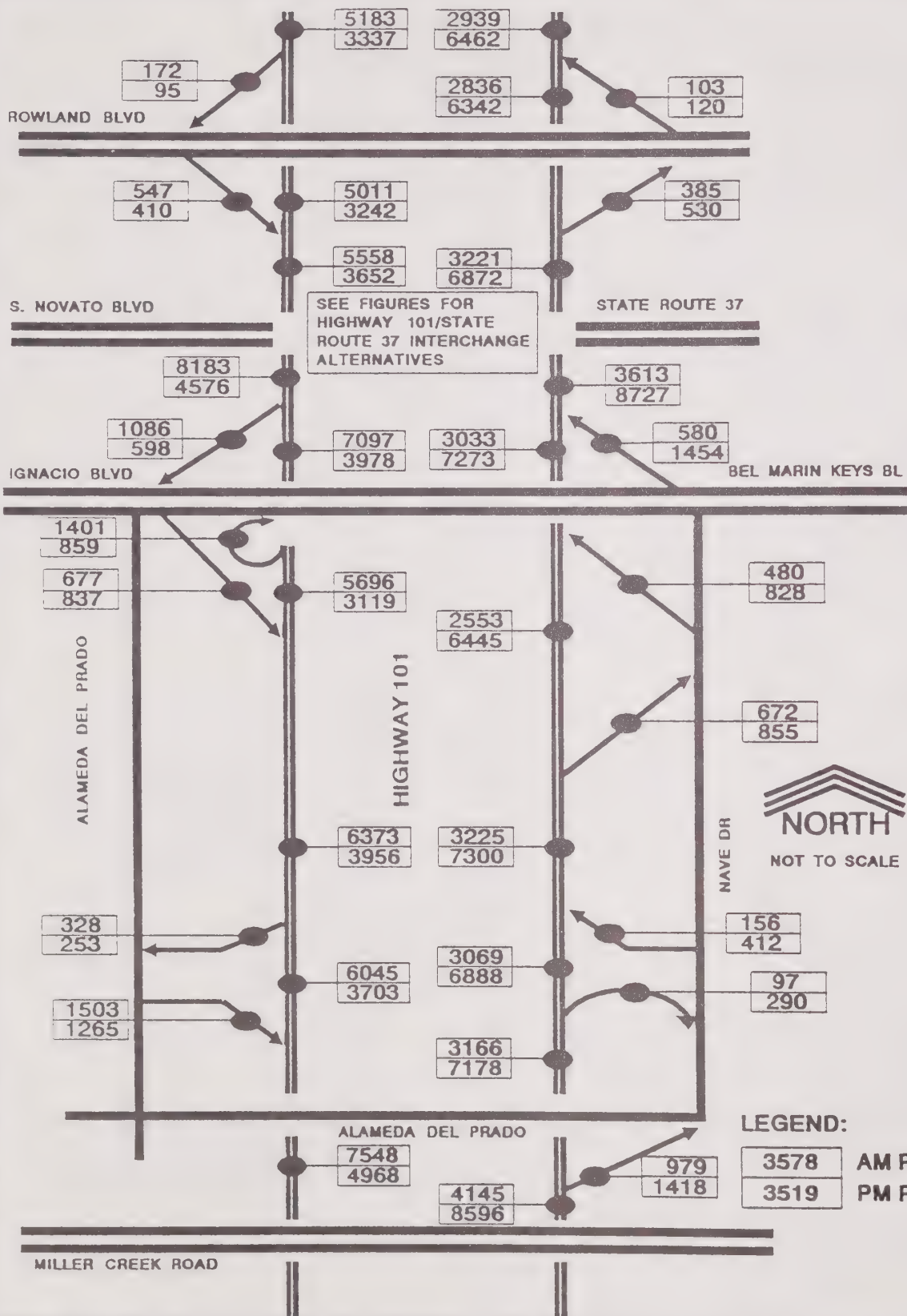


YEAR 1997 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITH McINNIS PARKWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

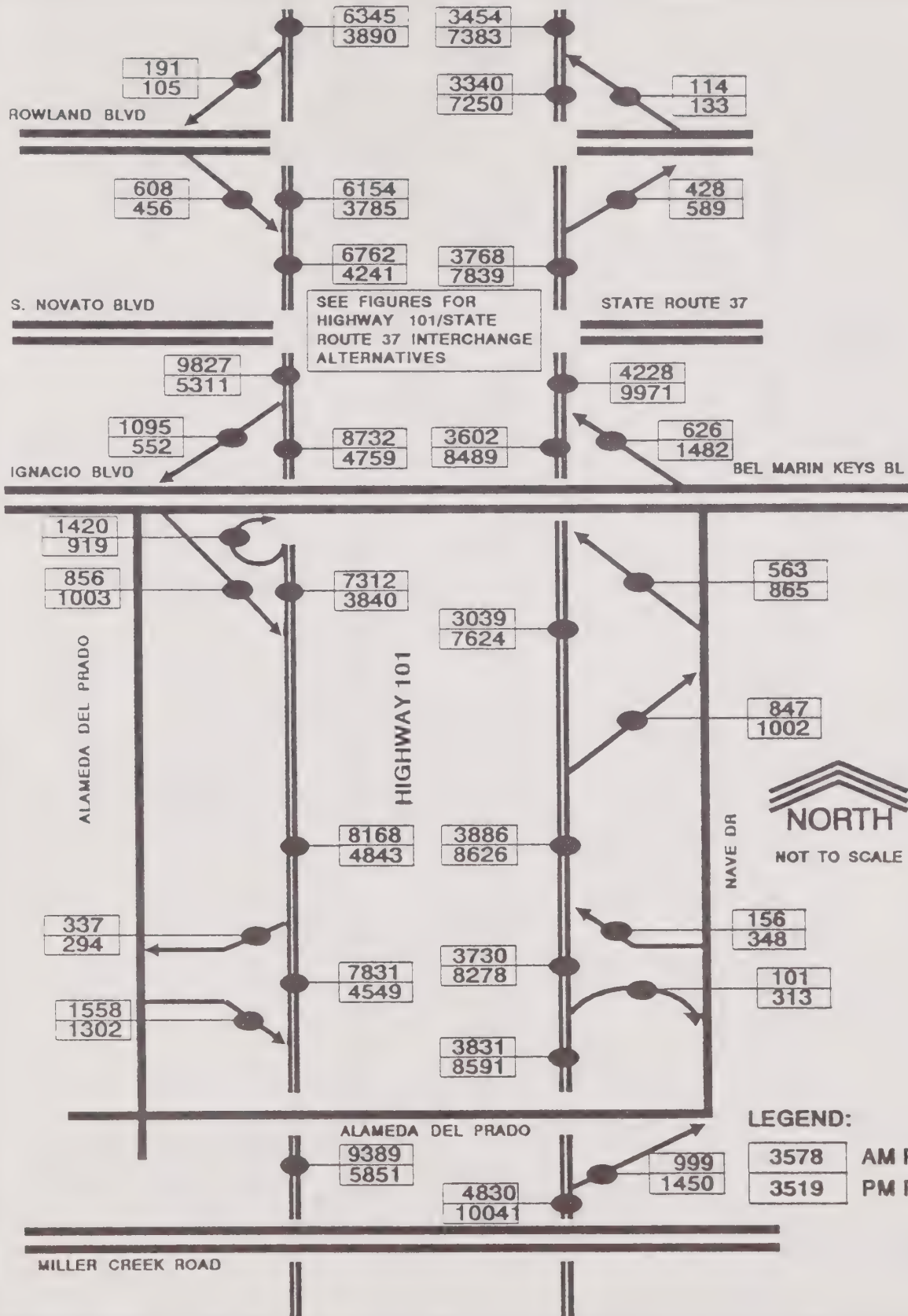




YEAR 2010 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITH McINNIS PARKWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

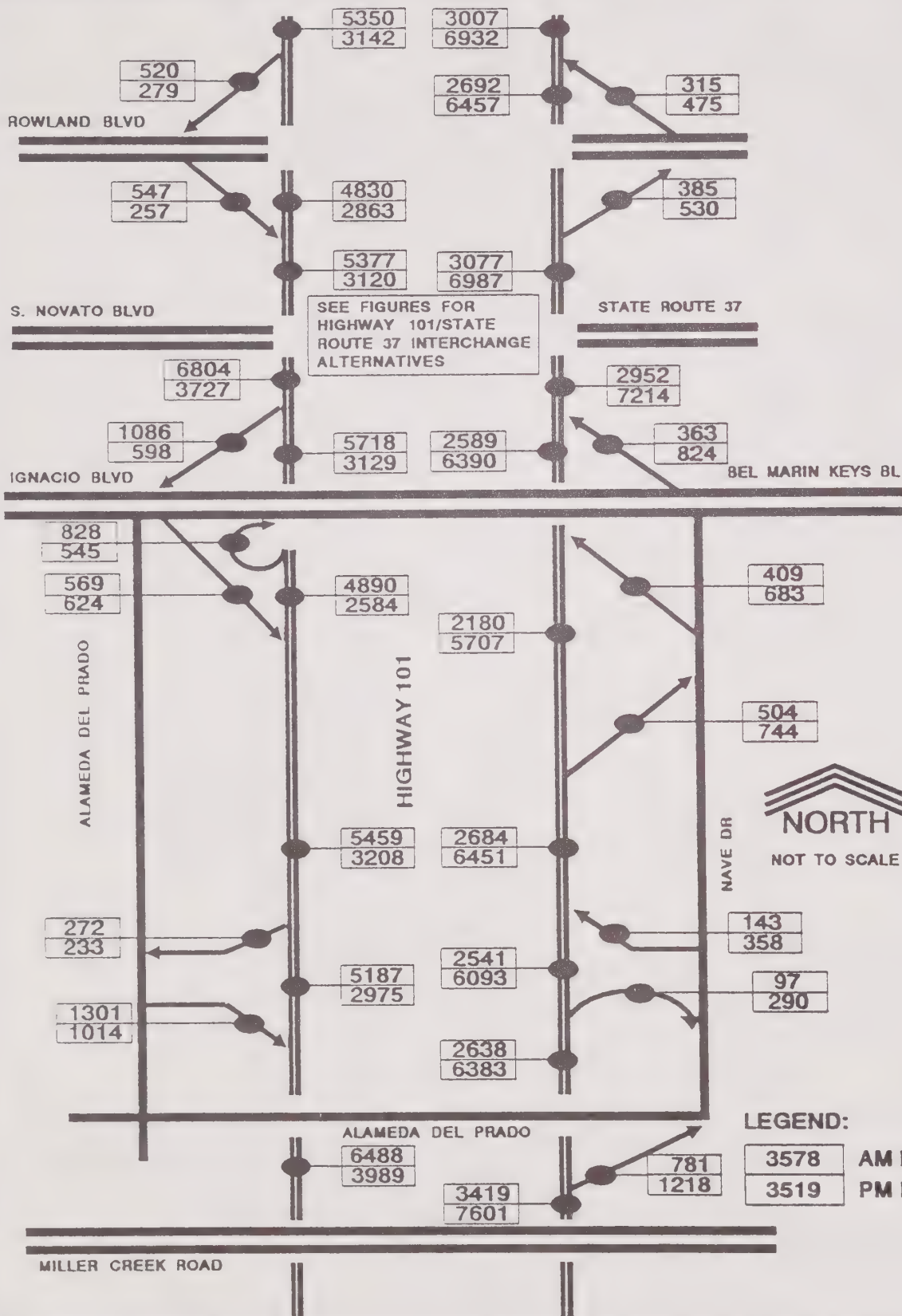


YEAR 1997 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITH TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study

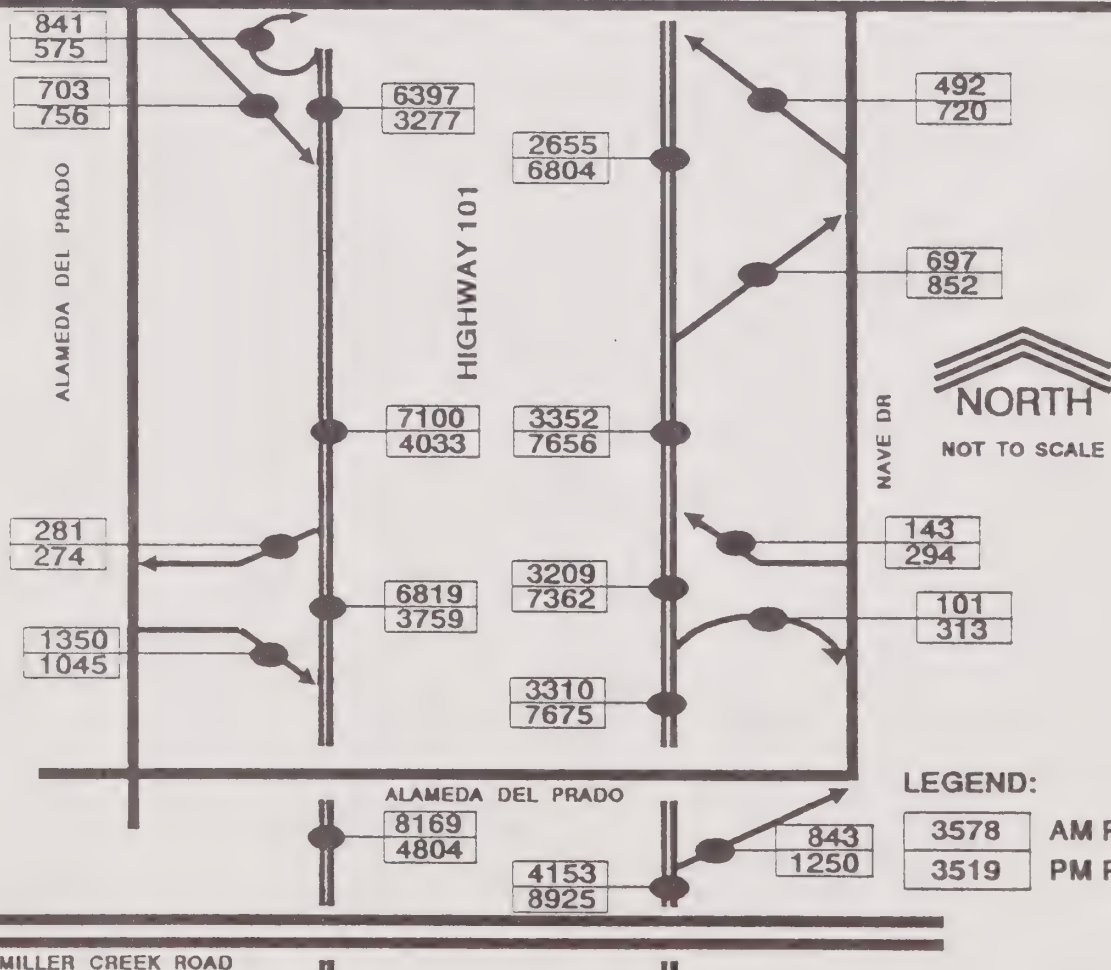
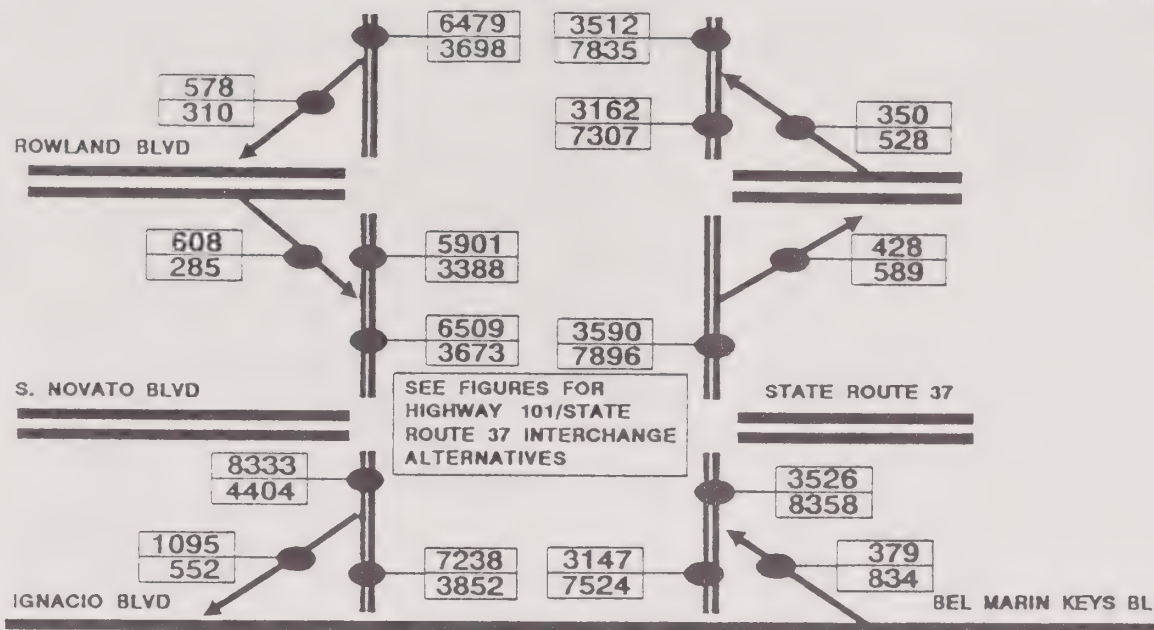


YEAR 2010 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITH TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study





YEAR 1997 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITH McINNIS PARKWAY AND TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study



YEAR 2010 PEAK HOUR HIGHWAY 101 MAINLINE  
AND RAMP VOLUMES  
WITH McINNIS PARKWAY AND TRANSITWAY  
Novato U.S. 101/SR 37 PSR Traffic Study



**ALTERNATIVE G**  
**PEAK HOUR**  
**TRAFFIC FLOW**  
**PROJECTIONS**  
**ON LOCAL**  
**STREETS**

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	398	609	0	0	0	0	0	1140	580	319	0	352
2	NAVE DRIVE/ STATE ACCESS ROAD	398	698	0	0	0	0	0	890	602	309	0	372
3	NAVE DRIVE/ MAIN GATE ROAD	477	987	0	0	0	0	0	1045	217	109	0	261
4	NAVE --SOUTH/ NB 101 RAMPS	0	1443	50	105	0	0	124	1181	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	50	130	5	5	5	20	40	55	298	1191	30	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1306	60	0	0	0	0	0	55	395	35	0	343
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1606	0	0	380	534	30	505	125	550	100	482	230
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	455	462	1830	880	0	0	0	0	210	360	130
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	687	251	30	10	690	270	1670	10	10	10	10
14	NAVE DRIVE/ BOLING	40	1403	0	0	0	0	0	1135	30	50	0	170

Link data file: G\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: AM97NONE.BGV

Generation file: HAM2am.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 1.00

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	401	1204	0	0	0	0	0	768	388	614	0	461
2 NAVE DRIVE/ STATE ACCESS ROAD	421	1026	0	0	0	0	0	902	327	579	0	521
3 NAVE DRIVE/ MAIN GATE ROAD	308	1273	0	0	0	0	0	1342	81	175	0	569
4 NAVE --SOUTH/ NB 101 RAMPS	0	1740	100	315	0	0	368	1493	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	75	70	5	5	40	40	110	110	107	1533	10	135
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1393	270	0	0	0	0	0	75	70	50	0	232
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	986	0	0	320	551	60	335	110	205	240	881	480
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	370	899	891	1357	380	0	0	0	0	750	710	100
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1319	589	70	20	840	320	1137	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1550	0	0	0	0	0	1861	50	30	0	50

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM97NONE.BGV  
 Generation file: HAM2pm.GEN  
 Geometry file: ALT\_G.GEO  
 Reduction factor: 1.00  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	398	649	0	0	0	0	0	1170	580	319	0	352
2	NAVE DRIVE/ STATE ACCESS ROAD	398	738	0	0	0	0	0	920	602	309	0	372
3	NAVE DRIVE/ MAIN GATE ROAD	477	1027	0	0	0	0	0	1075	217	109	0	261
4	NAVE --SOUTH/ NB 101 RAMPS	0	1463	50	110	0	0	124	1181	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	70	150	5	5	5	20	40	60	298	1221	30	60
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1351	70	0	0	0	0	0	60	410	40	0	348
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1626	0	0	480	644	30	640	130	550	130	692	320
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	500	455	642	1920	900	0	0	0	0	260	510	160
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	717	261	30	10	880	350	1730	10	10	10	10
14	NAVE DRIVE/ BOLING	40	1463	0	0	0	0	0	1305	30	50	0	190

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM10NONE.BGV  
 Generation file: HAM2am.GEN  
 Geometry file: ALT\_G.GEO  
 Reduction factor: 1.00  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)  
 PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	401	1354	0	0	0	0	0	828	388	614	0	461
2 NAVE DRIVE/ STATE ACCESS ROAD	421	1176	0	0	0	0	0	962	327	579	0	521
3 NAVE DRIVE/ MAIN GATE ROAD	308	1423	0	0	0	0	0	1402	81	175	0	569
4 NAVE --SOUTH/ NB 101 RAMPS	0	1790	100	340	0	0	298	1553	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	90	90	5	5	40	40	110	150	107	1553	10	170
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1423	280	0	0	0	0	0	90	80	70	0	257
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1051	0	0	440	631	60	390	130	210	290	1051	520
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	500	899	1061	1407	480	0	0	0	0	780	825	130
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1459	599	70	20	1000	350	1187	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1700	0	0	0	0	0	1921	50	30	0	50

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM10NONE.BGV  
 Generation file: HAM2pm.GEN  
 Geometry file: ALI\_G.GEO  
 Reduction factor: 1.00  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	279	485	0	0	0	0	0	891	357	195	0	247
2	NAVE DRIVE/ STATE ACCESS ROAD	279	555	0	0	0	0	0	719	418	209	0	267
3	NAVE DRIVE/ MAIN GATE ROAD	334	748	0	0	0	0	0	807	178	86	0	188
4	NAVE --SOUTH/ NB 101 RAMPS	0	1061	50	105	0	0	105	891	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	50	130	5	5	5	20	40	29	214	927	30	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1016	60	0	0	0	0	0	55	395	35	0	259
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	917	0	0	380	512	30	505	125	550	100	457	122
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	322	319	437	1383	616	0	0	0	0	84	252	104
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	526	165	30	10	552	270	1197	10	10	10	10
14	NAVE DRIVE/ BOLING	40	1021	0	0	0	0	0	826	30	50	0	170

Link data file: G\_MCINN1.LNK

Distribution file: DIST3

Existing Traffic file: AM97Mcin.BGV

Generation file: HAM2am.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 0.70

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	281	967	0	0	0	0	0	598	238	377	0	323
2 NAVE DRIVE/ STATE ACCESS ROAD	301	864	0	0	0	0	0	716	205	384	0	383
3 NAVE DRIVE/ MAIN GATE ROAD	218	1032	0	0	0	0	0	1046	53	133	0	419
4 NAVE --SOUTH/ NB 101 RAMPS	0	1410	100	315	0	0	288	1127	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	75	70	5	5	40	40	110	90	78	1187	10	135
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1027	270	0	0	0	0	0	75	70	50	0	203
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	599	0	0	320	524	60	335	110	205	240	853	267
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	259	629	863	1056	266	0	0	0	0	300	497	80
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1022	413	70	20	729	320	816	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1220	0	0	0	0	0	1415	50	30	0	50

Link data file: G\_MCINNI.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM97mcin.BGV  
 Generation file: HAM2pm.GEN  
 Geometry file: ALT\_G.GEO  
 Reduction factor: 0.70  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	279	525	0	0	0	0	0	915	357	195	0	247
2 NAVE DRIVE/ STATE ACCESS ROAD	279	595	0	0	0	0	0	743	418	209	0	267
3 NAVE DRIVE/ MAIN GATE ROAD	334	788	0	0	0	0	0	831	178	86	0	188
4 NAVE --SOUTH/ NB 101 RAMPS	0	1081	50	110	0	0	105	885	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	70	150	5	5	5	20	40	28	214	957	30	60
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1055	70	0	0	0	0	0	60	410	40	0	264
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	931	0	0	480	622	30	640	130	550	130	667	167
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	350	319	617	1473	630	0	0	0	0	104	357	128
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	556	175	30	10	730	350	1251	10	10	10	10
14 NAVE DRIVE/ BOLING	40	1081	0	0	0	0	0	990	30	50	0	190

Link data file: G\_MCINNI.LNK

Distribution file: DIST3

Existing Traffic file: AM10mcin.BGV

Generation file: HAM2am.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 0.70

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	281	1117	0	0	0	0	0	652	238	377	0	323
2 NAVE DRIVE/ STATE ACCESS ROAD	301	1014	0	0	0	0	0	770	205	384	0	383
3 NAVE DRIVE/ MAIN GATE ROAD	218	1182	0	0	0	0	0	1100	53	133	0	419
4 NAVE --SOUTH/ NB 101 RAMPS	0	1460	100	340	0	0	218	1181	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	90	90	5	5	40	40	110	124	78	1207	10	170
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1051	280	0	0	0	0	0	90	80	70	0	228
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	634	0	0	440	604	60	390	130	210	290	1023	272
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	350	629	1033	1106	336	0	0	0	0	312	577	104
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1162	423	70	20	850	350	860	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1370	0	0	0	0	0	1469	50	30	0	50

Link data file: G\_MCIINNI.LNK

Distribution file: DIST3

Existing Traffic file: PM10mcin.BGV

Generation file: HAM2pm.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 0.70

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	339	538	0	0	0	0	0	1008	493	271	0	300
2	NAVE DRIVE/ STATE ACCESS ROAD	339	610	0	0	0	0	0	787	520	266	0	318
3	NAVE DRIVE/ MAIN GATE ROAD	405	852	0	0	0	0	0	912	193	97	0	222
4	NAVE --SOUTH/ NB 101 RAMPS	0	1238	46	97	0	0	110	1025	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	46	120	5	5	5	18	37	51	254	1034	28	51
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1140	55	0	0	0	0	0	51	363	32	0	296
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1401	0	0	350	486	28	465	115	506	92	437	212
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	423	387	419	1602	810	0	0	0	0	193	331	120
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	594	223	28	9	635	248	1455	9	9	9	9
14	NAVE DRIVE/ BOLING	37	1202	0	0	0	0	0	979	28	46	0	156

Link data file: G\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: AM97TRaN.BGV

Generation file: HAM2am.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 0.85

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	341	1065	0	0	0	0	0	680	330	522	0	392
2	NAVE DRIVE/ STATE ACCESS ROAD	359	908	0	0	0	0	0	792	279	497	0	447
3	NAVE DRIVE/ MAIN GATE ROAD	262	1114	0	0	0	0	0	1170	70	153	0	488
4	NAVE --SOUTH/ NB 101 RAMPS	0	1524	92	290	0	0	320	1293	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	69	64	5	5	37	37	101	101	92	1330	9	124
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1201	248	0	0	0	0	0	69	64	46	0	207
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	859	0	0	294	500	55	308	101	189	221	804	442
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	340	764	813	1194	350	0	0	0	0	690	653	92
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	1145	525	64	18	773	294	991	28	18	9	9
14	NAVE DRIVE/ BOLING	175	1349	0	0	0	0	0	1613	46	28	0	46

Link data file: G\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM97TRaW.BGV  
 Generation file: HAM2pm.GEN  
 Geometry file: ALT\_G.GEO  
 Reduction factor: 0.85  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
		---	---	---	---	---	---	---	---	---	---	---	---
1	NAVE DRIVE/ NEW ENTERANCE ROAD	339	575	0	0	0	0	0	1036	493	271	0	300
2	NAVE DRIVE/ STATE ACCESS ROAD	339	647	0	0	0	0	0	814	520	266	0	318
3	NAVE DRIVE/ MAIN GATE ROAD	405	889	0	0	0	0	0	939	193	97	0	222
4	NAVE --SOUTH/ NB 101 RAMPs	0	1257	46	101	0	0	110	1025	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	64	138	5	5	5	18	37	55	254	1062	28	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPs	1181	64	0	0	0	0	0	55	377	37	0	300
9	SB HWY 101 RAMPs/ IGNACIO BOUEVARD	1420	0	0	442	587	28	589	120	506	120	630	294
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	387	584	1685	828	0	0	0	0	239	469	147
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	622	232	28	9	810	322	1510	9	9	9	9
14	NAVE DRIVE/ BOLING	37	1257	0	0	0	0	0	1135	28	46	0	175

Link data file: G\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: AM10TRan.BGV

Generation file: HAM2am.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 0.85

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	341	1203	0	0	0	0	0	735	330	522	0	392
2	NAVE DRIVE/ STATE ACCESS ROAD	359	1046	0	0	0	0	0	848	279	497	0	447
3	NAVE DRIVE/ MAIN GATE ROAD	262	1252	0	0	0	0	0	1226	70	153	0	488
4	NAVE --SOUTH/ NB 101 RAMPS	0	1570	92	313	0	0	256	1348	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	83	83	5	5	37	37	101	138	92	1348	9	156
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1228	258	0	0	0	0	0	83	74	64	0	230
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	919	0	0	405	574	55	359	120	193	267	960	478
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	764	969	1240	442	0	0	0	0	718	759	120
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	1273	534	64	18	920	322	1037	28	18	9	9
14	NAVE DRIVE/ BOLING	175	1487	0	0	0	0	0	1668	46	28	0	46

Link data file: G\_NOPKWY.LNK  
Distribution file: DIST3  
Existing Traffic file: PM10TRaN.BGV  
Generation file: HAM2pm.GEN  
Geometry file: ALT\_G.GEO  
Reduction factor: 0.85  
Time of run: 10:51:52  
Date of run: 03/17/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	259	448	0	0	0	0	0	820	331	181	0	229
2	NAVE DRIVE/ STATE ACCESS ROAD	259	513	0	0	0	0	0	662	387	194	0	247
3	NAVE DRIVE/ MAIN GATE ROAD	310	693	0	0	0	0	0	745	164	79	0	174
4	NAVE --SOUTH/ NB 101 RAMPS	0	984	46	97	0	0	97	823	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	46	120	5	5	5	18	37	25	198	858	28	51
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	938	55	0	0	0	0	0	51	363	32	0	240
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	828	0	0	350	471	28	465	115	506	92	421	104
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	285	296	403	1278	546	0	0	0	0	67	223	94
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	487	152	28	9	497	248	1105	9	9	9	9
14	NAVE DRIVE/ BOLING	37	948	0	0	0	0	0	764	28	46	0	156

Link data file: G\_MCINN1.LNK

Distribution file: DIST3

Existing Traffic file: AM97BOTH.BGV

Generation file: HAM2am.GEN

Geometry file: ALT\_G.GEO

Reduction factor: 0.65

Time of run: 10:51:52

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	261	894	0	0	0	0	0	551	221	351	0	300
2 NAVE DRIVE/ STATE ACCESS ROAD	279	797	0	0	0	0	0	660	190	356	0	355
3 NAVE DRIVE/ MAIN GATE ROAD	203	954	0	0	0	0	0	965	49	122	0	388
4 NAVE --SOUTH/ NB 101 RAMPS	0	1304	92	290	0	0	266	1042	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	69	64	5	5	37	37	101	81	72	1099	9	124
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	950	248	0	0	0	0	0	69	64	46	0	187
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	545	0	0	294	482	55	308	101	189	221	786	229
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	229	584	795	976	236	0	0	0	0	240	440	72
12 NAVE DRIVE/ NB 101 OFF-RAMP	28	947	380	64	18	662	294	753	28	18	9	9
14 NAVE DRIVE/ BOLING	175	1129	0	0	0	0	0	1309	46	28	0	46

Link data file: G\_MCINNI.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM97BOTH.BGV  
 Generation file: HAM2pm.GEN  
 Geometry file: ALT\_G.GEO  
 Reduction factor: 0.65  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	259	485	0	0	0	0	0	842	331	181	0	229
2 NAVE DRIVE/ STATE ACCESS ROAD	259	550	0	0	0	0	0	683	387	194	0	247
3 NAVE DRIVE/ MAIN GATE ROAD	310	730	0	0	0	0	0	766	164	79	0	174
4 NAVE --SOUTH/ NB 101 RAMPS	0	1003	46	101	0	0	97	817	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	64	138	5	5	5	18	37	23	198	886	28	55
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	973	64	0	0	0	0	0	55	377	37	0	244
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	841	0	0	442	572	28	589	120	506	120	614	141
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	310	296	568	1361	558	0	0	0	0	83	316	115
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	515	161	28	9	660	322	1154	9	9	9	9
14 NAVE DRIVE/ BOLING	37	1003	0	0	0	0	0	914	28	46	0	175

Link data file: G\_MCINNI.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM10BOTH.BGV  
 Generation file: HAM2am.GEN  
 Geometry file: ALT\_G.GEO  
 Reduction factor: 0.65  
 Time of run: 10:51:52  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	261	1032	0	0	0	0	0	600	221	351	0	300
2	NAVE DRIVE/ STATE ACCESS ROAD	279	935	0	0	0	0	0	710	190	356	0	355
3	NAVE DRIVE/ MAIN GATE ROAD	203	1092	0	0	0	0	0	1015	49	122	0	388
4	NAVE --SOUTH/ NB 101 RAMPS	0	1350	92	313	0	0	202	1091	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	83	83	5	5	37	37	101	112	72	1117	9	156
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	971	258	0	0	0	0	0	83	74	64	0	210
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	575	0	0	405	556	55	359	120	193	267	942	231
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	310	584	951	1022	298	0	0	0	0	250	512	94
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	1075	389	64	18	770	322	793	28	18	9	9
14	NAVE DRIVE/ BOLING	175	1267	0	0	0	0	0	1358	46	28	0	46

Link data file: G\_MCINN1.LNK  
Distribution file: DIST3  
Existing Traffic file: PM10BOTH.BGV  
Generation file: HAM2pm.GEN  
Geometry file: ALT\_G.GEO  
Reduction factor: 0.65  
Time of run: 10:51:52  
Date of run: 03/17/88  
Wilbur Smith and Associates, 1986,87,88

# **ALTERNATIVE F**

**PEAK HOUR  
TRAFFIC FLOW  
PROJECTIONS  
ON LOCAL  
STREETS**

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITHOUT MC INNIS

		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	398	609	0	0	0	0	0	1140	580	319	0	352
2	NAVE DRIVE/ STATE ACCESS ROAD	398	698	0	0	0	0	0	890	602	309	0	372
3	NAVE DRIVE/ MAIN GATE ROAD	477	987	0	0	0	0	0	1045	217	109	0	261
4	NAVE --SOUTH/ NB 101 RAMPS	0	1443	50	105	0	0	124	1181	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	50	130	5	5	5	20	40	55	298	1191	30	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1306	60	0	0	0	0	0	55	395	35	0	343
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1956	0	0	380	534	30	200	125	100	100	482	230
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	455	462	1830	880	0	0	0	0	210	360	130
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	687	251	30	10	690	270	1670	10	10	10	10
14	NAVE DRIVE/ BOLING	40	1403	0	0	0	0	0	1135	30	50	0	170
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	405	0	0	0	0	0

Link data file: F\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: AM97NONf.BGV

Generation file: HAM\_AM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 1.00

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITHOUT MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	401	1204	0	0	0	0	0	768	388	614	0	461
2	NAVE DRIVE/ STATE ACCESS ROAD	421	1026	0	0	0	0	0	902	327	579	0	521
3	NAVE DRIVE/ MAIN GATE ROAD	308	1273	0	0	0	0	0	1342	81	175	0	569
4	NAVE --SOUTH/ NB 101 RAMPS	0	1740	100	315	0	0	368	1493	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	75	70	5	5	40	40	110	110	107	1533	10	135
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1393	270	0	0	0	0	0	75	70	50	0	232
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1121	0	0	320	551	60	70	110	70	240	881	480
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	370	899	891	1357	380	0	0	0	0	750	710	100
12	NAVE DRIVE/ NB 101 OFF-RAMP	30	1319	589	70	20	840	320	1137	30	10	20	10
14	NAVE DRIVE/ BOLING	190	1550	0	0	0	0	0	1861	50	30	0	50
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	270	0	0	0	0	0

Link data file: F\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: PM97NONf.BGV

Generation file: HAM\_PM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 1.00

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITHOUT MC INNIS

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	398	649	0	0	0	0	0	1170	580	319	0	352
2 NAVE DRIVE/ STATE ACCESS ROAD	398	738	0	0	0	0	0	920	602	309	0	372
3 NAVE DRIVE/ MAIN GATE ROAD	477	1027	0	0	0	0	0	1075	217	109	0	261
4 NAVE --SOUTH/ NB 101 RAMPS	0	1463	50	110	0	0	124	1181	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	70	150	5	5	5	20	40	60	298	1221	30	60
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1351	70	0	0	0	0	0	60	410	40	0	348
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1976	0	0	480	644	30	200	130	150	130	692	320
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	500	455	642	1920	900	0	0	0	0	260	510	160
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	717	261	30	10	880	350	1730	10	10	10	10
14 NAVE DRIVE/ BOLING	40	1463	0	0	0	0	0	1305	30	50	0	190
15 IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	490	0	0	0	0	0

Link data file: F\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM10NONf.BGV  
 Generation file: HAM\_AM.GEN  
 Geometry file: ALT\_F.GEO  
 Reduction factor: 1.00  
 Time of run: 09:07:24  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITHOUT MC INNIS

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	401	1354	0	0	0	0	0	828	388	614	0	461
2 NAVE DRIVE/ STATE ACCESS ROAD	421	1176	0	0	0	0	0	962	327	579	0	521
3 NAVE DRIVE/ MAIN GATE ROAD	308	1423	0	0	0	0	0	1402	81	175	0	569
4 NAVE --SOUTH/ NB 101 RAMP	0	1790	100	340	0	0	298	1553	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	90	90	5	5	40	40	110	150	107	1553	10	170
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMP	1423	280	0	0	0	0	0	90	80	70	0	257
9 SB HWY 101 RAMP/ IGNACIO BOUEVARD	1191	0	0	440	631	60	100	130	70	290	1051	520
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	500	899	1061	1407	480	0	0	0	0	780	825	130
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1459	599	70	20	1000	350	1187	30	10	20	10
14 NAVE DRIVE/ BOLING	190	1700	0	0	0	0	0	1921	50	30	0	50
15 IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	290	0	0	0	0	0

Link data file: F\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: PM10NONf.BGV

Generation file: HAM\_PM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 1.00

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	279	485	0	0	0	0	0	891	357	195	0	247
2	NAVE DRIVE/ STATE ACCESS ROAD	279	555	0	0	0	0	0	719	418	209	0	267
3	NAVE DRIVE/ MAIN GATE ROAD	334	748	0	0	0	0	0	807	178	86	0	188
4	NAVE --SOUTH/ NB 101 RAMP	0	1061	50	105	0	0	105	891	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	50	130	5	5	5	20	40	29	214	927	30	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMP	1016	60	0	0	0	0	0	55	395	35	0	259
9	SB HWY 101 RAMP/ IGNACIO BOUEVARD	1267	0	0	380	512	30	200	125	100	100	457	122
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	322	319	437	1383	616	0	0	0	0	84	252	104
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	526	165	30	10	552	270	1197	10	10	10	10
14	NAVE DRIVE/ BOLING	40	1021	0	0	0	0	0	826	30	50	0	170
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	405	0	0	0	0	0

Link data file: F\_MCINNI.LNK

Distribution file: DIST3

Existing Traffic file: AM97Mcif.BGV

Generation file: HAM\_AM.GEN

Geometry file:

Reduction factor: 0.70

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	281	967	0	0	0	0	0	598	238	377	0	323
2	NAVE DRIVE/ STATE ACCESS ROAD	301	864	0	0	0	0	0	716	205	384	0	383
3	NAVE DRIVE/ MAIN GATE ROAD	218	1032	0	0	0	0	0	1046	53	133	0	419
4	NAVE --SOUTH/ NB 101 RAMPS	0	1410	100	315	0	0	288	1127	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	75	70	5	5	40	40	110	90	78	1187	10	135
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1027	270	0	0	0	0	0	75	70	50	0	203
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	734	0	0	320	524	60	70	110	70	240	853	267
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	259	629	863	1056	266	0	0	0	0	300	497	80
12	NAVE DRIVE/ NB 101 OFF-RAMP	30	1022	413	70	20	729	320	816	30	10	20	10
14	NAVE DRIVE/ BOLING	190	1220	0	0	0	0	0	1415	50	30	0	50
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	270	0	0	0	0	0

Link data file: F\_MCINNI.LNK

Distribution file: DIST3

Existing Traffic file: PM97mcif.BGV

Generation file: HAM\_PM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 0.70

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	279	525	0	0	0	0	0	915	357	195	0	247
2 NAVE DRIVE/ STATE ACCESS ROAD	279	595	0	0	0	0	0	743	418	209	0	267
3 NAVE DRIVE/ MAIN GATE ROAD	334	788	0	0	0	0	0	831	178	86	0	188
4 NAVE --SOUTH/ NB 101 RAMPS	0	1081	50	110	0	0	105	885	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	70	150	5	5	5	20	40	28	214	957	30	60
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1055	70	0	0	0	0	0	60	410	40	0	264
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1281	0	0	480	622	30	200	130	150	130	667	167
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	350	319	617	1473	630	0	0	0	0	104	357	128
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	556	175	30	10	730	350	1251	10	10	10	10
14 NAVE DRIVE/ BOLING	40	1081	0	0	0	0	0	990	30	50	0	190
15 IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	490	0	0	0	0	0

Link data file: F\_MCINNI.LNK

Distribution file: DIST3

Existing Traffic file: AM10mcif.8GV

Generation file: HAM\_AM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 0.70

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	281	1117	0	0	0	0	0	652	238	377	0	323
2	NAVE DRIVE/ STATE ACCESS ROAD	301	1014	0	0	0	0	0	770	205	384	0	383
3	NAVE DRIVE/ MAIN GATE ROAD	218	1182	0	0	0	0	0	1100	53	133	0	419
4	NAVE --SOUTH/ NB 101 RAMPS	0	1460	100	340	0	0	218	1181	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	90	90	5	5	40	40	110	124	78	1207	10	170
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1051	280	0	0	0	0	0	90	80	70	0	228
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	774	0	0	440	604	60	100	130	70	290	1023	273
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	350	629	1033	1106	336	0	0	0	0	312	578	104
12	NAVE DRIVE/ NB 101 OFF-RAMP	30	1162	423	70	20	850	350	860	30	10	20	10
14	NAVE DRIVE/ BOLING	190	1370	0	0	0	0	0	1469	50	30	0	50
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	290	0	0	0	0	0

Link data file: F\_MCINNI.LNK

Distribution file: DIST3

Existing Traffic file: PM10mcif.BGV

Generation file: HAM\_PM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 0.70

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH TRANSITWAY

INTERSECTION		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	339	538	0	0	0	0	0	1008	493	271	0	300
2	NAVE DRIVE/ STATE ACCESS ROAD	339	610	0	0	0	0	0	787	520	266	0	318
3	NAVE DRIVE/ MAIN GATE ROAD	405	852	0	0	0	0	0	912	193	97	0	222
4	NAVE --SOUTH/ NB 101 RAMPS	0	1238	46	97	0	0	110	1025	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	46	120	5	5	5	18	37	51	254	1034	28	51
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1140	55	0	0	0	0	0	51	363	32	0	296
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1723	0	0	350	486	28	184	115	92	92	437	212
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	423	387	419	1602	810	0	0	0	0	193	331	120
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	594	223	28	9	635	248	1455	9	9	9	9
14	NAVE DRIVE/ BOLING	37	1202	0	0	0	0	0	979	28	46	0	156
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	373	0	0	0	0	0

Link data file: F\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM97TRaf.BGV  
 Generation file: HAM\_AM.GEN  
 Geometry file: ALT\_F.GEO  
 Reduction factor: 0.85  
 Time of run: 09:07:24  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH TRANSITWAY

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	341	1065	0	0	0	0	0	680	330	522	0	392
2	NAVE DRIVE/ STATE ACCESS ROAD	359	908	0	0	0	0	0	792	279	497	0	447
3	NAVE DRIVE/ MAIN GATE ROAD	262	1114	0	0	0	0	0	1170	70	153	0	488
4	NAVE --SOUTH/ NB 101 RAMPS	0	1524	92	290	0	0	320	1293	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	69	64	5	5	37	37	101	101	92	1330	9	124
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1201	248	0	0	0	0	0	69	64	46	0	207
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	983	0	0	294	500	55	64	101	64	221	804	442
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	340	764	813	1194	350	0	0	0	0	690	653	92
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	1145	525	64	18	773	294	991	28	9	18	9
14	NAVE DRIVE/ BOLING	175	1349	0	0	0	0	0	1613	46	28	0	46
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	248	0	0	0	0	0

Link data file: F\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM97TRaf.BGV  
 Generation file: HAM\_PM.GEN  
 Geometry file: ALT\_F.GEO  
 Reduction factor: 0.85  
 Time of run: 09:07:24  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH TRANSITWAY

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	339	575	0	0	0	0	0	1036	493	271	0	300
2	NAVE DRIVE/ STATE ACCESS ROAD	339	647	0	0	0	0	0	814	520	266	0	318
3	NAVE DRIVE/ MAIN GATE ROAD	405	889	0	0	0	0	0	939	193	97	0	222
4	NAVE --SOUTH/ NB 101 RAMPS	0	1257	46	101	0	0	110	1025	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	64	138	5	5	5	18	37	55	254	1062	28	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1181	64	0	0	0	0	0	55	377	37	0	300
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1742	0	0	442	587	28	184	120	138	120	630	294
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	387	584	1685	828	0	0	0	0	239	469	147
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	622	232	28	9	810	322	1510	9	9	9	9
14	NAVE DRIVE/ BOLING	37	1257	0	0	0	0	0	1135	28	46	0	175
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	451	0	0	0	0	0

Link data file: F\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: AM10Traf.8GV

Generation file: HAM\_AM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 0.85

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH TRANSITWAY

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	341	1203	0	0	0	0	0	735	330	522	0	392
2 NAVE DRIVE/ STATE ACCESS ROAD	359	1046	0	0	0	0	0	848	279	497	0	447
3 NAVE DRIVE/ MAIN GATE ROAD	262	1252	0	0	0	0	0	1226	70	153	0	488
4 NAVE --SOUTH/ NB 101 RAMPS	0	1570	92	313	0	0	256	1348	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	83	83	5	5	37	37	101	138	92	1348	9	156
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1228	258	0	0	0	0	0	83	74	64	0	230
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1048	0	0	405	574	55	92	120	64	267	960	478
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	764	969	1240	442	0	0	0	0	718	759	120
12 NAVE DRIVE/ NB 101 OFF-RAMP	28	1273	534	64	18	920	322	1037	28	9	18	9
14 NAVE DRIVE/ BOLING	175	1487	0	0	0	0	0	1668	46	28	0	46
15 IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	267	0	0	0	0	0

Link data file: F\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: PM10TRaf.BGV

Generation file: HAM\_PM.GEN

Geometry file: ALT\_F.GEO

Reduction factor: 0.85

Time of run: 09:07:24

Date of run: 03/17/88

Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997

AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH BOTH

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	259	448	0	0	0	0	0	820	331	181	0	229
2 NAVE DRIVE/ STATE ACCESS ROAD	259	513	0	0	0	0	0	662	387	194	0	247
3 NAVE DRIVE/ MAIN GATE ROAD	310	693	0	0	0	0	0	745	164	79	0	174
4 NAVE --SOUTH/ NB 101 RAMPS	0	984	46	97	0	0	97	823	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	46	120	5	5	5	18	37	25	198	858	28	51
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	938	55	0	0	0	0	0	51	363	32	0	240
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1150	0	0	350	471	28	184	115	92	92	421	104
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	285	296	403	1278	546	0	0	0	0	67	223	94
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	487	152	28	9	497	248	1105	9	9	9	9
14 NAVE DRIVE/ BOLING	37	948	0	0	0	0	0	764	28	46	0	156
15 IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	373	0	0	0	0	0

Link data file: F\_MCINNI.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM97BOTf.BGV  
 Generation file: HAM\_AM.GEN  
 Geometry file: ALT\_F.GEO  
 Reduction factor: 0.65  
 Time of run: 09:07:24  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997  
 PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH BOTH

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	261	894	0	0	0	0	0	551	221	351	0	300
2 NAVE DRIVE/ STATE ACCESS ROAD	279	797	0	0	0	0	0	660	190	356	0	355
3 NAVE DRIVE/ MAIN GATE ROAD	203	954	0	0	0	0	0	965	49	122	0	388
4 NAVE --SOUTH/ NB 101 RAMPS	0	1304	92	290	0	0	266	1042	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	69	64	5	5	37	37	101	81	72	1099	9	124
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	950	248	0	0	0	0	0	69	64	46	0	187
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	669	0	0	294	482	55	64	101	64	221	786	229
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	229	584	795	976	236	0	0	0	0	240	440	72
12 NAVE DRIVE/ NB 101 OFF-RAMP	28	947	380	64	18	662	294	753	28	9	18	9
14 NAVE DRIVE/ BOLING	175	1129	0	0	0	0	0	1309	46	28	0	46
15 IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	248	0	0	0	0	0

Link data file: F\_MCINNI.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM97BOTf.BGV  
 Generation file: HAM\_PM.GEN  
 Geometry file: ALT\_F.GEO  
 Reduction factor: 0.65  
 Time of run: 09:07:24  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)  
AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH BOTH

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	259	485	0	0	0	0	0	842	331	181	0	229
2	NAVE DRIVE/ STATE ACCESS ROAD	259	550	0	0	0	0	0	683	387	194	0	247
3	NAVE DRIVE/ MAIN GATE ROAD	310	730	0	0	0	0	0	766	164	79	0	174
4	NAVE --SOUTH/ NB 101 RAMPS	0	1003	46	101	0	0	97	817	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	64	138	5	5	5	18	37	23	198	886	28	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	973	64	0	0	0	0	0	55	377	37	0	244
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1163	0	0	442	572	28	184	120	138	120	614	141
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	310	296	568	1361	558	0	0	0	0	83	316	115
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	515	161	28	9	660	322	1154	9	9	9	9
14	NAVE DRIVE/ BOLING	37	1003	0	0	0	0	0	914	28	46	0	175
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	451	0	0	0	0	0

Link data file: F\_MCINN1.LNK  
Distribution file: DIST3  
Existing Traffic file: AM10BOTf.BGV  
Generation file: HAM\_AM.GEN  
Geometry file: ALT\_F.GEO  
Reduction factor: 0.65  
Time of run: 09:07:24  
Date of run: 03/17/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010)  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE F NETWORK -- WITH BOTH

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	261	1032	0	0	0	0	0	600	221	351	0	300
2	NAVE DRIVE/ STATE ACCESS ROAD	279	935	0	0	0	0	0	710	190	356	0	355
3	NAVE DRIVE/ MAIN GATE ROAD	203	1092	0	0	0	0	0	1015	49	122	0	388
4	NAVE --SOUTH/ NB 101 RAMPS	0	1350	92	313	0	0	202	1091	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	83	83	5	5	37	37	101	112	72	1117	9	156
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	971	258	0	0	0	0	0	83	74	64	0	210
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	704	0	0	405	556	55	92	120	64	267	942	231
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	310	584	951	1022	298	0	0	0	0	250	512	94
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	1075	389	64	18	770	322	793	28	9	18	9
14	NAVE DRIVE/ BOLING	175	1267	0	0	0	0	0	1358	46	28	0	46
15	IGNACIO BLVD./ NEW SB OFF-RAMP	0	0	0	0	0	0	267	0	0	0	0	0

Link data file: F\_MCINNI.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM10BOTf.BGV  
 Generation file: HAM\_PM.GEN  
 Geometry file: ALT\_F.GEO  
 Reduction factor: 0.65  
 Time of run: 09:07:24  
 Date of run: 03/17/88  
 Wilbur Smith and Associates, 1986,87,88

# **TSM SCENARIO**

**ALTERNATIVE G  
PEAK HOUR  
TRAFFIC FLOW  
PROJECTIONS  
ON LOCAL  
STREETS**



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	339	561	0	0	0	0	0	1053	493	271	0	300
2 NAVE DRIVE/ STATE ACCESS ROAD	339	629	0	0	0	0	0	822	530	270	0	320
3 NAVE DRIVE/ MAIN GATE ROAD	405	867	0	0	0	0	0	939	203	101	0	224
4 NAVE --SOUTH/ NB 101 RAMPS	0	1253	50	105	0	0	115	1049	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	50	130	5	5	5	20	40	55	256	1059	30	55
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1174	60	0	0	0	0	0	55	395	35	0	301
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1443	0	0	380	523	30	505	125	550	100	469	230
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	387	449	1656	880	0	0	0	0	210	360	130
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	606	235	30	10	690	270	1496	10	10	10	10
14 NAVE DRIVE/ BOLING	40	1213	0	0	0	0	0	994	30	50	0	170

Link data file: T\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM97NONE.BGV  
 Generation file: AMTSM.GEN  
 Geometry file: ALT\_T.GEO  
 Reduction factor: 1.00  
 Time of run: 14:36:09  
 Date of run: 03/25/88  
 Wilbur Smith and Associates, 1986,87,88

TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	366	1187	0	0	0	0	0	740	360	597	0	436
2 NAVE DRIVE/ STATE ACCESS ROAD	386	987	0	0	0	0	0	872	304	565	0	496
3 NAVE DRIVE/ MAIN GATE ROAD	287	1202	0	0	0	0	0	1292	76	171	0	556
4 NAVE --SOUTH/ NB 101 RAMPS	0	1648	100	315	0	0	368	1430	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	75	70	5	5	40	40	110	110	104	1470	10	135
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1330	270	0	0	0	0	0	75	70	50	0	229
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	937	0	0	320	542	60	335	110	205	240	874	480
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	370	874	884	1299	380	0	0	0	0	750	710	100
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1288	585	70	20	840	320	1079	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1458	0	0	0	0	0	1798	50	30	0	50

Link data file: T\_NOPKWY.LNK  
Distribution file: DIST3  
Existing Traffic file: PM97NONE.BGV  
Generation file: PMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 1.00  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	339	601	0	0	0	0	0	1083	493	271	0	300
2 NAVE DRIVE/ STATE ACCESS ROAD	339	669	0	0	0	0	0	852	530	270	0	320
3 NAVE DRIVE/ MAIN GATE ROAD	405	907	0	0	0	0	0	969	203	101	0	224
4 NAVE --SOUTH/ NB 101 RAMPS	0	1273	50	110	0	0	115	1049	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	70	150	5	5	5	20	40	60	256	1089	30	60
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1219	70	0	0	0	0	0	60	410	40	0	306
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1463	0	0	480	633	30	640	130	550	130	679	320
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	500	387	629	1746	900	0	0	0	0	260	510	160
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	636	245	30	10	880	350	1556	10	10	10	10
14 NAVE DRIVE/ BOLING	40	1273	0	0	0	0	0	1164	30	50	0	190

Link data file: T\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM10NONE.BGV  
 Generation file: AMTSM.GEN  
 Geometry file: ALT\_T.GEO  
 Reduction factor: 1.00  
 Time of run: 14:36:09  
 Date of run: 03/25/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITHOUT MC INNIS

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	366	1337	0	0	0	0	0	800	360	597	0	436
2 NAVE DRIVE/ STATE ACCESS ROAD	386	1137	0	0	0	0	0	932	304	565	0	496
3 NAVE DRIVE/ MAIN GATE ROAD	287	1352	0	0	0	0	0	1352	76	171	0	556
4 NAVE --SOUTH/ NB 101 RAMP	0	1698	100	340	0	0	298	1490	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	90	90	5	5	40	40	110	150	104	1490	10	170
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMP	1360	280	0	0	0	0	0	90	80	70	0	254
9 SB HWY 101 RAMP/ IGNACIO BOUEVARD	1002	0	0	440	622	60	390	130	210	290	1044	520
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	500	874	1054	1349	480	0	0	0	0	780	825	130
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1428	595	70	20	1000	350	1129	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1608	0	0	0	0	0	1858	50	30	0	50

Link data file: T\_NOPKWY.LNK  
Distribution file: DIST3  
Existing Traffic file: PM10NONE.BGV  
Generation file: PMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 1.00  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	237	456	0	0	0	0	0	837	303	166	0	210
2	NAVE DRIVE/ STATE ACCESS ROAD	237	508	0	0	0	0	0	673	374	185	0	230
3	NAVE DRIVE/ MAIN GATE ROAD	284	664	0	0	0	0	0	733	170	81	0	163
4	NAVE --SOUTH/ NB 101 RAMPS	0	928	50	105	0	0	98	798	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	50	130	5	5	5	20	40	29	185	834	30	55
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	923	60	0	0	0	0	0	55	395	35	0	230
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	818	0	0	380	504	30	505	125	550	100	449	122
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	322	271	429	1276	616	0	0	0	0	84	252	104
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	469	163	30	10	552	270	1090	10	10	10	10
14	NAVE DRIVE/ BOLING	40	888	0	0	0	0	0	727	30	50	0	170

Link data file: T\_MCINNI.LNK  
Distribution file: DIST3  
Existing Traffic file: AM97Mcin.BGV  
Generation file: AMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 0.70  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM

PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	256	957	0	0	0	0	0	581	221	367	0	305
2 NAVE DRIVE/ STATE ACCESS ROAD	276	837	0	0	0	0	0	695	191	376	0	365
3 NAVE DRIVE/ MAIN GATE ROAD	204	982	0	0	0	0	0	1010	50	131	0	410
4 NAVE --SOUTH/ NB 101 RAMPS	0	1346	100	315	0	0	288	1083	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	75	70	5	5	40	40	110	90	76	1143	10	135
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	983	270	0	0	0	0	0	75	70	50	0	201
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	570	0	0	320	518	60	335	110	205	240	849	267
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	259	612	859	1021	266	0	0	0	0	300	497	80
12 NAVE DRIVE/ NB 101 OFF-RAMP	30	1001	413	70	20	729	320	781	30	20	10	10
14 NAVE DRIVE/ BOLING	190	1156	0	0	0	0	0	1371	50	30	0	50

Link data file: T\_MCINNI.LNK

Distribution file: DIST3

Existing Traffic file: PM97mcin.BGV

Generation file: PMTSM.GEN

Geometry file: ALT\_T.GEO

Reduction factor: 0.70

Time of run: 14:36:09

Date of run: 03/25/88

Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	237	496	0	0	0	0	0	861	303	166	0	210
2 NAVE DRIVE/ STATE ACCESS ROAD	237	548	0	0	0	0	0	697	374	185	0	230
3 NAVE DRIVE/ MAIN GATE ROAD	284	704	0	0	0	0	0	757	170	81	0	163
4 NAVE --SOUTH/ NB 101 RAMPS	0	948	50	110	0	0	98	792	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	70	150	5	5	5	20	40	28	185	864	30	60
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	962	70	0	0	0	0	0	60	410	40	0	235
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	832	0	0	480	614	30	640	130	550	130	659	167
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	350	271	609	1366	630	0	0	0	0	104	357	128
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	499	173	30	10	730	350	1144	10	10	10	10
14 NAVE DRIVE/ BOLING	40	948	0	0	0	0	0	891	30	50	0	190

Link data file: T\_MCINN1.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM10mcin.BGV  
 Generation file: AMTSM.GEN  
 Geometry file: ALT\_T.GEO  
 Reduction factor: 0.70  
 Time of run: 14:36:09  
 Date of run: 03/25/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH MC INNIS

INTERSECTION		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	256	1107	0	0	0	0	0	635	221	367	0	305
2	NAVE DRIVE/ STATE ACCESS ROAD	276	987	0	0	0	0	0	749	191	376	0	365
3	NAVE DRIVE/ MAIN GATE ROAD	204	1132	0	0	0	0	0	1064	50	131	0	410
4	NAVE --SOUTH/ NB 101 RAMPS	0	1396	100	340	0	0	218	1137	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	90	90	5	5	40	40	110	124	76	1163	10	170
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1007	280	0	0	0	0	0	90	80	70	0	226
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	605	0	0	440	598	60	390	130	210	290	1019	272
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	350	612	1029	1071	336	0	0	0	0	312	577	104
12	NAVE DRIVE/ NB 101 OFF-RAMP	30	1141	423	70	20	850	350	825	30	20	10	10
14	NAVE DRIVE/ BOLING	190	1306	0	0	0	0	0	1425	50	30	0	50

Link data file: T\_MCINNI.LNK  
Distribution file: DIST3  
Existing Traffic file: PM10mcin.BGV  
Generation file: PMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 0.70  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
 AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

		M O V E M E N T											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
INTERSECTION		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	322	524	0	0	0	0	0	983	468	257	0	285
2	NAVE DRIVE/ STATE ACCESS ROAD	322	591	0	0	0	0	0	768	500	255	0	303
3	NAVE DRIVE/ MAIN GATE ROAD	385	818	0	0	0	0	0	882	189	94	0	212
4	NAVE --SOUTH/ NB 101 RAMPS	0	1185	46	97	0	0	107	988	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	46	120	5	5	5	18	37	51	242	997	28	51
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1103	55	0	0	0	0	0	51	363	32	0	284
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1355	0	0	350	483	28	465	115	506	92	434	212
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	423	367	416	1553	810	0	0	0	0	193	331	120
12	NAVE DRIVE/ NB 101 OFF-RAMP	5	571	219	28	9	635	248	1406	9	9	9	9
14	NAVE DRIVE/ BOLING	37	1149	0	0	0	0	0	938	28	46	0	156

Link data file: T\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: AM97TRaN.BGV  
 Generation file: AMTSM.GEN  
 Geometry file: ALT\_T.GEO  
 Reduction factor: 0.95  
 Time of run: 14:36:09  
 Date of run: 03/25/88  
 Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	347	1110	0	0	0	0	0	692	342	567	0	414
2 NAVE DRIVE/ STATE ACCESS ROAD	365	922	0	0	0	0	0	817	288	535	0	469
3 NAVE DRIVE/ MAIN GATE ROAD	272	1127	0	0	0	0	0	1214	71	160	0	526
4 NAVE --SOUTH/ NB 101 RAMPS	0	1547	92	290	0	0	347	1349	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	69	64	5	5	37	37	101	101	98	1386	9	124
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1257	248	0	0	0	0	0	69	64	46	0	213
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	881	0	0	294	501	55	308	101	189	221	807	442
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	340	830	816	1217	350	0	0	0	0	690	653	92
12 NAVE DRIVE/ NB 101 OFF-RAMP	28	1215	545	64	18	773	294	1014	28	18	9	9
14 NAVE DRIVE/ BOLING	175	1372	0	0	0	0	0	1696	46	28	0	46

Link data file: T\_NOPKWY.LNK  
Distribution file: DIST3  
Existing Traffic file: PM97TRaN.BGV  
Generation file: PMTSM.GEN  
Geometry file: ALT\_I.GEO  
Reduction factor: 0.95  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	322	561	0	0	0	0	0	1011	468	257	0	285
2 NAVE DRIVE/ STATE ACCESS ROAD	322	628	0	0	0	0	0	795	500	255	0	303
3 NAVE DRIVE/ MAIN GATE ROAD	385	855	0	0	0	0	0	909	189	94	0	212
4 NAVE --SOUTH/ NB 101 RAMPS	0	1204	46	101	0	0	107	988	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	64	138	5	5	5	18	37	55	242	1025	28	55
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1144	64	0	0	0	0	0	55	377	37	0	288
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	1374	0	0	442	584	28	589	120	506	120	627	294
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	367	581	1636	828	0	0	0	0	239	469	147
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	599	228	28	9	810	322	1461	9	9	9	9
14 NAVE DRIVE/ BOLING	37	1204	0	0	0	0	0	1094	28	46	0	175

Link data file: T\_NOPKWY.LNK

Distribution file: DIST3

Existing Traffic file: AM10TRaN.BGV

Generation file: AMTSM.GEN

Geometry file: ALT\_T.GEO

Reduction factor: 0.95

Time of run: 14:36:09

Date of run: 03/25/88

Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH TRANSITWAY

INTERSECTION		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	347	1248	0	0	0	0	0	747	342	567	0	414
2	NAVE DRIVE/ STATE ACCESS ROAD	365	1060	0	0	0	0	0	873	288	535	0	469
3	NAVE DRIVE/ MAIN GATE ROAD	272	1265	0	0	0	0	0	1270	71	160	0	526
4	NAVE --SOUTH/ NB 101 RAMPS	0	1593	92	313	0	0	283	1404	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	83	83	5	5	37	37	101	138	98	1404	9	156
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	1284	258	0	0	0	0	0	83	74	64	0	236
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	941	0	0	405	575	55	359	120	193	267	963	478
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	460	830	972	1263	442	0	0	0	0	718	759	120
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	1343	554	64	18	920	322	1060	28	18	9	9
14	NAVE DRIVE/ BOLING	175	1510	0	0	0	0	0	1751	46	28	0	46

Link data file: T\_NOPKWY.LNK  
 Distribution file: DIST3  
 Existing Traffic file: PM10TRaN.BGV  
 Generation file: PMtsm.GEN  
 Geometry file: ALT\_T.GEO  
 Reduction factor: 0.95  
 Time of run: 14:36:09  
 Date of run: 03/25/88  
 Wilbur Smith and Associates, 1986,87,88



## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION	MOVEMENT											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	227	426	0	0	0	0	0	779	290	159	0	201
2 NAVE DRIVE/ STATE ACCESS ROAD	227	477	0	0	0	0	0	627	353	176	0	219
3 NAVE DRIVE/ MAIN GATE ROAD	272	629	0	0	0	0	0	688	157	75	0	155
4 NAVE --SOUTH/ NB 101 RAMPS	0	881	46	97	0	0	92	752	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	46	120	5	5	5	18	37	25	176	787	28	51
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	867	55	0	0	0	0	0	51	363	32	0	218
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	752	0	0	350	465	28	465	115	506	92	414	104
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	285	259	396	1196	546	0	0	0	0	67	223	94
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	444	150	28	9	497	248	1023	9	9	9	9
14 NAVE DRIVE/ BOLING	37	845	0	0	0	0	0	687	28	46	0	156

Link data file: T\_MCINNI.LNK  
Distribution file: DIST3  
Existing Traffic file: AM97BOTH.BGV  
Generation file: AMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 0.67  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- 1997 WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION		MOVEMENT											
		NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
		RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	NAVE DRIVE/ NEW ENTERANCE ROAD	245	894	0	0	0	0	0	541	211	351	0	292
2	NAVE DRIVE/ STATE ACCESS ROAD	263	781	0	0	0	0	0	650	182	357	0	347
3	NAVE DRIVE/ MAIN GATE ROAD	194	922	0	0	0	0	0	950	47	122	0	390
4	NAVE --SOUTH/ NB 101 RAMPS	0	1264	92	290	0	0	272	1023	0	0	0	0
6	ALAMDEA DEL PRADO/ CLAY COURT	69	64	5	5	37	37	101	81	72	1080	9	124
7	ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	931	248	0	0	0	0	0	69	64	46	0	187
9	SB HWY 101 RAMPS/ IGNACIO BOUEVARD	529	0	0	294	478	55	308	101	189	221	784	229
11	NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	229	586	793	956	236	0	0	0	0	240	440	72
12	NAVE DRIVE/ NB 101 OFF-RAMP	28	946	382	64	18	662	294	733	28	18	9	9
14	NAVE DRIVE/ BOLING	175	1089	0	0	0	0	0	1295	46	28	0	46

Link data file: T\_MCINNI.LNK  
Distribution file: DIST3  
Existing Traffic file: PM97BOTH.BGV  
Generation file: PMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 0.67  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
AM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	227	463	0	0	0	0	0	801	290	159	0	201
2 NAVE DRIVE/ STATE ACCESS ROAD	227	514	0	0	0	0	0	648	353	176	0	219
3 NAVE DRIVE/ MAIN GATE ROAD	272	666	0	0	0	0	0	709	157	75	0	155
4 NAVE --SOUTH/ NB 101 RAMPS	0	900	46	101	0	0	92	746	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	64	138	5	5	5	18	37	23	176	815	28	55
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	902	64	0	0	0	0	0	55	377	37	0	222
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	765	0	0	442	566	28	589	120	506	120	607	141
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	310	259	561	1279	558	0	0	0	0	83	316	115
12 NAVE DRIVE/ NB 101 OFF-RAMP	5	472	159	28	9	660	322	1072	9	9	9	9
14 NAVE DRIVE/ BOLING	37	900	0	0	0	0	0	837	28	46	0	175

Link data file: T\_MCINNI.LNK  
Distribution file: DIST3  
Existing Traffic file: AM10BOTH.BGV  
Generation file: AMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 0.67  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

## TURNING MOVEMENTS AND VOLUME-CAPACITY RATIOS -- TOTAL TRAFFIC

TRAFFIC IMPACT STUDY FOR HIGHWAY 101 PROJECT -- FUTURE (2010) WITH TSM  
PM PEAK HOUR TRAFFIC -- ON ALTERNATIVE G NETWORK -- WITH BOTH

INTERSECTION	M O V E M E N T											
	NORTHBOUND			EASTBOUND			SOUTHBOUND			WESTBOUND		
	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1 NAVE DRIVE/ NEW ENTERANCE ROAD	245	1032	0	0	0	0	0	590	211	351	0	292
2 NAVE DRIVE/ STATE ACCESS ROAD	263	919	0	0	0	0	0	700	182	357	0	347
3 NAVE DRIVE/ MAIN GATE ROAD	194	1060	0	0	0	0	0	1000	47	122	0	390
4 NAVE --SOUTH/ NB 101 RAMPS	0	1310	92	313	0	0	208	1072	0	0	0	0
6 ALAMDEA DEL PRADO/ CLAY COURT	83	83	5	5	37	37	101	112	72	1098	9	156
7 ALAMDEA DEL PRADO/ SB HWY 101 RAMPS	952	258	0	0	0	0	0	83	74	64	0	210
9 SB HWY 101 RAMPS/ IGNACIO BOUEVARD	559	0	0	405	552	55	359	120	193	267	940	231
11 NAVE DRIVE/101 NB/ IGNACIO BOUEVARD	310	586	949	1002	298	0	0	0	0	250	512	94
12 NAVE DRIVE/ NB 101 OFF-RAMP	28	1074	391	64	18	770	322	773	28	18	9	9
14 NAVE DRIVE/ BOLING	175	1227	0	0	0	0	0	1344	46	28	0	46

Link data file: T\_MCINNI.LNK  
Distribution file: DIST3  
Existing Traffic file: PM10BOTH.BGV  
Generation file: PMTSM.GEN  
Geometry file: ALT\_T.GEO  
Reduction factor: 0.67  
Time of run: 14:36:09  
Date of run: 03/25/88  
Wilbur Smith and Associates, 1986,87,88

US101/SR37 PSR

Weaving Sections on US101 Southbound During AM Peak Hour

SUBSECTION:

SCENARIO: /1/ =====	Rowland Blvd to Novato Blvd.				Novato Blvd. to Ignacio Blvd.				Ignacio Blvd. to Alameda Del Prado			
	Weaving Vehicles /2/		Non-Weaving Vehicles /2/		Weaving Vehicles /2/		Non-Weaving Vehicles /2/		Weaving Vehicles /2/		Non-Weaving Vehicles /2/	
	mph	LOS	mph	LOS	mph	LOS	mph	LOS	mph	LOS	mph	LOS
	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
1. Existing /3/	49	C	54	B	41	D	40	E	49	C	53	C
2. 1997 /4/												
a. w/o MP or T	50	B	55	B	39	E	38	E	50	B	56	B
b. w/ MP only	49	C	54	B	41	D	42	D	52	B	58	B
c. w/ T only	49	C	54	B	40	D	39	E	51	B	57	B
d. w/ both MP and T	49	C	54	B	42	D	43	D	52	B	58	B
3. 2010 /4/												
a. w/o MP or T	48	C	52	C	38	E	35	E	48	C	53	C
b. w/ MP only	47	C	52	C	40	D	39	E	49	C	55	B
c. w/ T only	49	C	54	B	38	E	36	E	49	C	54	B
d. w/ both MP and T	48	C	53	C	40	D	40	E	50	B	56	B

Notes:

/1/ MP = McGinnis Parkway; T = Transitway

/2/ All weaving speeds and levels of service calculated using FHWA software and FREQ8 O-D tables.

/3/ Figures based on existing traffic and freeway configuration.

/4/ 1997 and 2010 figures are based on projected traffic with four through lanes plus auxiliary lanes.

US101/SR37 PSR

Weaving Sections on US101 Northbound During PM Peak Hour

SUBSECTION:

SCENARIO: /1/ =====	Alameda Del Prado to Nave Drive				Ignacio Blvd. to Novato Blvd.				Novato Blvd. to Rowland Blvd.			
	Weaving Vehicles /2/		Non-Weaving Vehicles /2/		Weaving Vehicles /2/		Non-Weaving Vehicles /2/		Weaving Vehicles /2/		Non-Weaving Vehicles /2/	
	-----		-----		-----		-----		-----		-----	
	mph	LOS	mph	LOS	mph	LOS	mph	LOS	mph	LOS	mph	LOS
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
1. Existing /3/	48	C	53	C	43	D	45	D	45	C	49	C
2. 1997 /4/												
a. w/o MP or T	49	C	54	B	41	D	42	D	48	C	53	C
b. w/ MP only	50	B	55	B	44	D	46	D	48	C	53	C
c. w/ T only	49	C	55	B	42	D	43	D	49	C	55	B
d. w/ both MP and T	50	B	56	B	45	C	48	C	47	C	52	C
3. 2010 /4/												
a. w/o MP or T	47	C	52	C	40	D	40	E	47	C	51	C
b. w/ MP only	48	C	53	C	42	D	44	D	47	C	51	C
c. w/ T only	48	C	53	C	40	D	40	E	48	C	53	C
d. w/ both MP and T	49	C	54	B	43	D	45	D	46	C	51	C

Notes:

/1/ MP = McGinnis Parkway; T = Transitway

/2/ All weaving speeds and levels of service calculated using FHWA software and FREQ8 0-0 tables.

/3/ Figures based on existing traffic and freeway configuration.

/4/ 1997 and 2010 figures are based on projected traffic with four through lanes plus auxiliary lanes.



WEAVING SECTIONS ON US-101  
SOUTHBOUND  
(AM PEAK HOUR)

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EXISTING CONDITIONS

1985 HCM: WEAVING AREAS

PAGE 1

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FACILITY SECTION... US-101 SOUTH, SOUTH OF ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-23-1988  
 MISC.INFO..... EXISTING CONDITIONS + CONFIGURATION

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	2,448	2,550	is the nonweaving vehicles on the freeway
V 2	64	66	is the down weaving vehicles
V 3	628	654	is the up weaving vehicles
V 4	12	12	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 3  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 3  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED  
 \*\*\*\*\*

	ANALYZED *****	MAXIMUM *****	
WEAVING VOLUME (VW) ..	719	3,000	
VOLUME RATIO (VR) ....	0.22	0.80	
WEAVING RATIO (R) ....	0.09	0.50	
WEAVING LENGTH (L) ...	3,410	2,500	*** EXCEEDS MAX

1985 HCM: WEAVING AREAS

PAGE 1

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FACILITY SECTION... US-101 SOUTH, SOUTH OF NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-23-1988  
 MISC.INFO..... EXISTING CONDITIONS + CONFIGURATION

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	3,176	3,308	is the nonweaving vehicles on the freeway
V 2	524	545	is the down weaving vehicles
V 3	1,776	1,850	is the up weaving vehicles
V 4	296	308	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 4  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 3  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	D	41 mph
NONWEAVING VEHICLES	E	40 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	2,392	3,000
VOLUME RATIO (VR) ....	0.40	0.80
WEAVING RATIO (R) ....	0.23	0.50
WEAVING LENGTH (L) ...	1,900	2,500

1985 HCM: WEAVING AREAS

PAGE 1

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FACILITY SECTION... US101 SOUTH, SOUTH OF IGNACIO  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-23-1988  
 MISC.INFO..... EXISTING CONDITIONS + CONFIGURATION

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	E HV	E W	E P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,272	4,450	is the nonweaving vehicles on the freeway
V 2	56	58	is the down weaving vehicles
V 3	624	650	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... 3  
 NO. OF LANES..... 3  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 3  
 (Upstream of Weave Section)

LOS SPEED  
 \*\*\* \*\*\*\*\*  
 WEAVING VEHICLES C 49 mph  
 NONWEAVING VEHICLES C 53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****	
WEAVING VOLUME (VW) ..	707	3,000	
VOLUME RATIO (VR) ....	0.14	0.80	
WEAVING RATIO (R) ....	0.08	0.50	
WEAVING LENGTH (L) ...	5,000	2,500	*** EXCEEDS MAX

WEAVING SECTIONS ON US-101  
SOUTHBOUND  
(AM PEAK HOUR)

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YEAR 1997

FACILITY SECTION... US-101 SOUTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,992	5,200	is the nonweaving vehicles on the freeway
V 2	80	83	is the down weaving vehicles
V 3	568	591	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	8	50 mph
NONWEAVING VEHICLES	8	55 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	673	3,000
VOLUME RATIO (VR)....	0.11	0.80
WEAVING RATIO (R)....	0.12	0.50
WEAVING LENGTH (L)...	3,410	2,500 *** EXCEEDS MAX



FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E 3	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,764	4,962	is the nonweaving vehicles on the freeway
V 2	796	829	is the down weaving vehicles
V 3	2,328	2,425	is the up weaving vehicles
V 4	388	404	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	E	39 mph
NONWEAVING VEHICLES	E	38 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM	
WEAVING VOLUME (VW)...	3,248	3,000	*** EXCEEDS MAX
VOLUME RATIO (VR)....	0.38	0.80	
WEAVING RATIO (R)....	0.25	0.50	
WEAVING LENGTH (L)...	1,900	2,500	

FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	W	P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vpn)	(pcph)	DESCRIPTION
V 1	5,148	5,362	is the nonweaving vehicles on the freeway
V 2	332	345	is the down weaving vehicles
V 3	692	720	is the up weaving vehicles
V 4	44	45	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	B	50 mph
NONWEAVING VEHICLES	B	56 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	1,064	3,000
VOLUME RATIO (VR)....	0.16	0.80
WEAVING RATIO (R)....	0.32	0.50
WEAVING LENGTH (L)...	5,000	2,500 *** EXCEEDS MAX

FACILITY SECTION... US-101 SOUTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH MCINNIS PARKWAY ONLY

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,088	4,258	is the nonweaving vehicles on the freeway
V 2	656	683	is the down weaving vehicles
V 3	496	516	is the up weaving vehicles
V 4	80	83	is the ramp-to-ramp nonweaving vehicles

D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	1,198	3,000
VOLUME RATIO (VR)....	0.22	0.80
WEAVING RATIO (R)....	0.43	0.50
WEAVING LENGTH (L)...	3,410	2,500 *** EXCEEDS MAX

FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH MCINNIS PARKWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	3,800	3,958	is the nonweaving vehicles on the freeway
V 2	784	816	is the down weaving vehicles
V 3	1,728	1,800	is the up weaving vehicles
V 4	360	375	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

LOS SPEED  
 \*\*\* \*\*\*\*\*  
 WEAVING VEHICLES 0 41 mph  
 NONWEAVING VEHICLES 0 42 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED  
 -----

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW)...	2,612	3,000
VOLUME RATIO (VR)....	0.38	0.80
WEAVING RATIO (R)....	0.31	0.50
WEAVING LENGTH (L)...	1,900	2,500

FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC. INFO..... YEAR 1997, WITH MCINNIS PARKWAY ONLY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	W	P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,372	4,554	is the nonweaving vehicles on the freeway
V 2	260	270	is the down weaving vehicles
V 3	592	616	is the up weaving vehicles
V 4	36	37	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	8	52 mph
NONWEAVING VEHICLES	8	58 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	886	3,000
VOLUME RATIO (VR)....	0.16	0.80
WEAVING RATIO (R)....	0.31	0.50
WEAVING LENGTH (L)...	5,000	2,500 *** EXCEEDS MAX

\*\*\*\*\*

FACILITY SECTION... US-101 SOUTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----

TERRAIN TYPE	E T	E B	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

-----

## C) INPUT VOLUMES

-----

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,380	4,562	is the nonweaving vehicles on the freeway
V 2	624	650	is the down weaving vehicles
V 3	540	562	is the up weaving vehicles
V 4	12	12	is the ramp-to-ramp nonweaving vehicles

-----

## D) ANALYSIS RESULTS

-----

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

LOS SPEED  
 \*\*\* \*\*\*\*\*

WEAVING VEHICLES C 49 mph  
 NONWEAVING VEHICLES B 54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	1,210	3,000
VOLUME RATIO (VR)....	0.21	0.80
WEAVING RATIO (R)....	0.46	0.50
WEAVING LENGTH (L)...	3,410	2,500 *** EXCEEDS MAX



FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E	E	E	f	f	f
	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(von)	(pcph)	DESCRIPTION
V 1	4,220	4,395	is the nonweaving vehicles on the freeway
V 2	700	729	is the down weaving vehicles
V 3	2,332	2,429	is the up weaving vehicles
V 4	388	404	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	D	40 mph
NONWEAVING VEHICLES	E	39 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	3,153	3,000 *** EXCEEDS MAX
VOLUME RATIO (VR)....	0.40	0.50
WEAVING RATIO (R)....	0.23	0.50
WEAVING LENGTH (L)...	1,900	2,500

FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,856	5,058	is the nonweaving vehicles on the freeway
V 2	292	304	is the down weaving vehicles
V 3	636	662	is the up weaving vehicles
V 4	40	41	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	3	51 mph
NONWEAVING VEHICLES	3	57 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	965	3,000
VOLUME RATIO (VR)....	0.16	0.80
WEAVING RATIO (R)....	0.31	0.50
WEAVING LENGTH (L)...	5,000	2,500 *** EXCEEDS MAX

\*\*\*\*\*

FACILITY SECTION... US 101 - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

-----

## C) INPUT VOLUMES

-----

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,176	4,350	is the nonweaving vehicles on the freeway
V 2	580	604	is the down weaving vehicles
V 3	480	500	is the up weaving vehicles
V 4	76	79	is the ramp-to-ramp nonweaving vehicles

-----

## D) ANALYSIS RESULTS

-----

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	1,102	3,000
VOLUME RATIO (VR)....	0.20	0.80
WEAVING RATIO (R)....	0.45	0.50
WEAVING LENGTH (L)...	3,410	2,500 *** EXCEEDS MAX

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FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f d	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	3,452	3,595	is the nonweaving vehicles on the freeway
V 2	724	754	is the down weaving vehicles
V 3	1,720	1,791	is the up weaving vehicles
V 4	364	379	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	0	42 mph
NONWEAVING VEHICLES	0	43 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	2,541	3,000
VOLUME RATIO (VR)....	0.39	0.80
WEAVING RATIO (R)....	0.30	0.50
WEAVING LENGTH (L)...	1,900	2,500

FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,100	4,270	is the nonweaving vehicles on the freeway
V 2	244	254	is the down weaving vehicles
V 3	536	558	is the up weaving vehicles
V 4	32	33	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	B	52 mph
NONWEAVING VEHICLES	B	58 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	811	3,000
VOLUME RATIO (VR)....	0.16	0.80
WEAVING RATIO (R)....	0.31	0.50
WEAVING LENGTH (L)...	5,000	2,500 *** EXCEEDS MAX





WEAVING SECTIONS ON US-101  
SOUTHBOUND  
(AM PEAK HOUR)

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YEAR 2010

FACILITY SECTION... US-101 SOUTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcpn)	DESCRIPTION
V 1	6,340	6,604	is the nonweaving vehicles on the freeway
V 2	72	75	is the down weaving vehicles
V 3	632	658	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	52 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	732	3,000
VOLUME RATIO (VR)....	0.10	0.80
WEAVING RATIO (R)....	0.10	0.50
WEAVING LENGTH (L)...	3,410	2,500 *** EXCEEDS MAX

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FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E 3	E 2	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vorn)	(pcph)	DESCRIPTION
V 1	6,152	6,408	is the nonweaving vehicles on the freeway
V 2	320	354	is the down weaving vehicles
V 3	2,808	2,925	is the up weaving vehicles
V 4	376	391	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	E	38 mph
NONWEAVING VEHICLES	E	35 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM	
WEAVING VOLUME (VW)...	3,773	3,000	*** EXCEEDS MAX
VOLUME RATIO (VR)....	0.36	0.80	
WEAVING RATIO (R)....	0.23	0.50	
WEAVING LENGTH (L)...	1,900	2,500	

FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,988	7,279	is the nonweaving vehicles on the freeway
V 2	344	358	is the down weaving vehicles
V 3	792	825	is the up weaving vehicles
V 4	40	41	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	1,181	3,000
VOLUME RATIO (VR)....	0.16	0.80
WEAVING RATIO (R)....	0.30	0.50
WEAVING LENGTH (L)...	5,000	2,500 *** EXCEEDS MAX

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FACILITY SECTION... US-101 SOUTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH MCINNIS PARKWAY ONLY

## A) ADJUSTMENT FACTORS

-----

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
-----	-----	-----	-----	-----	-----	-----
LEVEL	1.7	1.5	1.5	0.96	1.00	1.00

## C) INPUT VOLUMES

-----

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,140	5,354	is the nonweaving vehicles on the freeway
V 2	724	754	is the down weaving vehicles
V 3	560	583	is the up weaving vehicles
V 4	80	83	is the ramp-to-ramp nonweaving vehicles

\*\*\*\*\*

## D) ANALYSIS RESULTS

-----

WEAVE TYPE..... 8  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	47 mph
NONWEAVING VEHICLES	C	52 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW)...	1,335	3,000
VOLUME RATIO (VR)....	0.20	0.80
WEAVING RATIO (R)....	0.44	0.50
WEAVING LENGTH (L)...	3,410	2,500 *** EXCEEDS MAX

FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH MCINNIS PARKWAY ONLY

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

TERRAIN TYPE	E	E	E	f	f	f
	T	S	R	HV	w	p
LEVEL	1.7	1.5	1.5	0.96	1.00	1.00

C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,344	5,045	is the nonweaving vehicles on the freeway
V 2	356	891	is the down weaving vehicles
V 3	2,132	2,220	is the up weaving vehicles
V 4	376	391	is the ramp-to-ramp nonweaving vehicles

D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	D	40 mph
NONWEAVING VEHICLES	E	39 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	3,107	3,000 *** EXCEEDS MAX
VOLUME RATIO (VR)....	0.36	0.80
WEAVING RATIO (R)....	0.29	0.50
WEAVING LENGTH (L)...	1,900	2,500



FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH MCINNIS PARKWAY ONLY

## A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f W	f P
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,152	6,408	is the nonweaving vehicles on the freeway
V 2	276	287	is the down weaving vehicles
V 3	744	775	is the up weaving vehicles
V 4	32	33	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

WEAVE TYPE..... 3  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	55 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW)...	1,060	3,000
VOLUME RATIO (VR)....	0.14	0.80
WEAVING RATIO (R)....	0.27	0.50
WEAVING LENGTH (L)...	5,000	2,500 *** EXCEEDS MAX

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 SOUTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,488	5,716	is the nonweaving vehicles on the freeway
V 2	112	116	is the down weaving vehicles
V 3	600	625	is the up weaving vehicles
V 4	12	12	is the ramp-to-ramp nonweaving vehicles

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## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	740	3,000
VOLUME RATIO (VR) ....	0.11	0.80
WEAVING RATIO (R) ....	0.16	0.50

## 1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

	E T	E B	E R	f HV	f w	f p
TERRAIN TYPE						
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,368	5,591	is the nonweaving vehicles on the freeway
V 2	720	750	is the down weaving vehicles
V 3	2,808	2,925	is the up weaving vehicles
V 4	376	391	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	E	38 mph
NONWEAVING VEHICLES	E	36 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****	
WEAVING VOLUME (VW) ..	3,669	3,000	*** EXCEEDS MAX
VOLUME RATIO (VR) ....	0.38	0.80	
WEAVING RATIO (R) ....	0.20	0.50	

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,452	6,720	is the nonweaving vehicles on the freeway
V 2	304	316	is the down weaving vehicles
V 3	820	854	is the up weaving vehicles
V 4	36	37	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,168	3,000
VOLUME RATIO (VR) ....	0.15	0.80
WEAVING RATIO (R) ....	0.27	0.50

## 1985 HCM: WEAVING AREAS

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FACILITY SECTION... US 101 - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,732	4,929	is the nonweaving vehicles on the freeway
V 2	616	641	is the down weaving vehicles
V 3	540	562	is the up weaving vehicles
V 4	68	70	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3410  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	1,202	3,000
VOLUME RATIO (VR) ....	0.19	0.80
WEAVING RATIO (R) ....	0.47	0.50



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 SOUTH - SOUTH NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,528	4,716	is the nonweaving vehicles on the freeway
V 2	744	775	is the down weaving vehicles
V 3	2,156	2,245	is the up weaving vehicles
V 4	352	366	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 1900  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	D	40 mph
NONWEAVING VEHICLES	E	40 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM	
	*****	*****	
WEAVING VOLUME (VW)...	3,016	3,000	*** EXCEEDS MAX
VOLUME RATIO (VR)....	0.37	0.80	
WEAVING RATIO (R)....	0.26	0.50	



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 SOUTH - SOUTH IGNACIO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... AM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,596	5,829	is the nonweaving vehicles on the freeway
V 2	248	258	is the down weaving vehicles
V 3	672	700	is the up weaving vehicles
V 4	32	33	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 5000  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	B	50 mph
NONWEAVING VEHICLES	B	56 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW)..	956	3,000
VOLUME RATIO (VR)....	0.14	0.80
WEAVING RATIO (R)....	0.27	0.50



**WEAVING SECTIONS ON US-101  
NORTHBOUND  
(PM PEAK HOUR)**

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**EXISTING CONDITIONS**

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH, SOUTH OF NAVE  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-23-88  
 MISC.INFO..... EXISTING CONDITIONS

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,044	5,254	is the nonweaving vehicles on the freeway
V 2	192	200	is the down weaving vehicles
V 3	124	129	is the up weaving vehicles
V 4	4	4	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 3  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 3  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****	
WEAVING VOLUME (VW) ..	328	3,000	
VOLUME RATIO (VR) ....	0.06	0.80	
WEAVING RATIO (R) ....	0.39	0.50	
WEAVING LENGTH (L) ...	4,810	2,500	*** EXCEEDS MAX

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH, SOUTH OF SR37/US101  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-23-88  
 MISC.INFO..... EXISTING CONDITIONS

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

	E	E	E	f	f	f
TERRAIN TYPE	T	B	R	HV	w	p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,656	4,850	is the nonweaving vehicles on the freeway
V 2	512	533	is the down weaving vehicles
V 3	984	1,025	is the up weaving vehicles
V 4	108	112	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 4  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 3  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	D	43 mph
NONWEAVING VEHICLES	D	45 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,555	3,000
VOLUME RATIO (VR) ....	0.24	0.80
WEAVING RATIO (R) ....	0.34	0.50
WEAVING LENGTH (L) ...	2,460	2,500

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH, SOUTH OF ROWLAND  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-23-88  
 MISC.INFO..... EXISTING CONDITIONS

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

	E T	E B	E R	f HV	f w	f p
TERRAIN TYPE						
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,732	4,929	is the nonweaving vehicles on the freeway
V 2	684	712	is the down weaving vehicles
V 3	64	66	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 3  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 3  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	45 mph
NONWEAVING VEHICLES	C	49 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

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	ANALYZED *****	MAXIMUM *****	
WEAVING VOLUME (VW) ..	777	3,000	
VOLUME RATIO (VR) ....	0.14	0.80	
WEAVING RATIO (R) ....	0.09	0.50	
WEAVING LENGTH (L) ...	3,650	2,500	*** EXCEEDS MAX



**WEAVING SECTIONS ON US-101  
NORTHBOUND  
(PM PEAK HOUR)**

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**YEAR 1997**

## 1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,964	6,212	is the nonweaving vehicles on the freeway
V 2	868	904	is the down weaving vehicles
V 3	408	425	is the up weaving vehicles
V 4	60	62	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,327	3,000
VOLUME RATIO (VR) ....	0.17	0.80
WEAVING RATIO (R) ....	0.32	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,228	6,487	is the nonweaving vehicles on the freeway
V 2	1,060	1,104	is the down weaving vehicles
V 3	1,412	1,470	is the up weaving vehicles
V 4	240	250	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	D	41 mph
NONWEAVING VEHICLES	D	42 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	2,570	3,000
VOLUME RATIO (VR) ....	0.28	0.80
WEAVING RATIO (R) ....	0.43	0.50

## 1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITHOUT PARKWAY OR TRANSITWAY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,448	6,716	is the nonweaving vehicles on the freeway
V 2	552	575	is the down weaving vehicles
V 3	76	79	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	653	3,000
VOLUME RATIO (VR) ....	0.09	0.80
WEAVING RATIO (R) ....	0.12	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH MCINNIS PARKWAY ONLY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,348	5,570	is the nonweaving vehicles on the freeway
V 2	772	804	is the down weaving vehicles
V 3	340	354	is the up weaving vehicles
V 4	48	50	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	B	50 mph
NONWEAVING VEHICLES	B	55 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,156	3,000
VOLUME RATIO (VR) ....	0.17	0.80
WEAVING RATIO (R) ....	0.31	0.50



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH MCINNIS PARKWAY ONLY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,564	5,795	is the nonweaving vehicles on the freeway
V 2	868	904	is the down weaving vehicles
V 3	800	833	is the up weaving vehicles
V 4	124	129	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	D	44 mph
NONWEAVING VEHICLES	D	46 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW) ..	1,734	3,000
VOLUME RATIO (VR) ....	0.23	0.80
WEAVING RATIO (R) ....	0.48	0.50



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH MCINNIS PARKWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,456	5,683	is the nonweaving vehicles on the freeway
V 2	504	525	is the down weaving vehicles
V 3	644	670	is the up weaving vehicles
V 4	60	62	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,193	3,000
VOLUME RATIO (VR) ....	0.17	0.80
WEAVING RATIO (R) ....	0.44	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

	E T	E B	E R	f HV	f w	f p
TERRAIN TYPE						
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,532	5,762	is the nonweaving vehicles on the freeway
V 2	804	837	is the down weaving vehicles
V 3	360	375	is the up weaving vehicles
V 4	52	54	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	55 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW) ..	1,210	3,000
VOLUME RATIO (VR) ....	0.17	0.80
WEAVING RATIO (R) ....	0.31	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,652	5,887	is the nonweaving vehicles on the freeway
V 2	1,068	1,112	is the down weaving vehicles
V 3	1,224	1,275	is the up weaving vehicles
V 4	232	241	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	D	42 mph
NONWEAVING VEHICLES	D	43 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW) ..	2,383	3,000
VOLUME RATIO (VR) ....	0.28	0.80
WEAVING RATIO (R) ....	0.47	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,716	5,954	is the nonweaving vehicles on the freeway
V 2	520	541	is the down weaving vehicles
V 3	80	83	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	55 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	624	3,000
VOLUME RATIO (VR) ....	0.09	0.80
WEAVING RATIO (R) ....	0.13	0.50



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH BOTH PKWY & TRANSWY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,848	5,050	is the nonweaving vehicles on the freeway
V 2	700	729	is the down weaving vehicles
V 3	320	333	is the up weaving vehicles
V 4	44	45	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	B	50 mph
NONWEAVING VEHICLES	B	56 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,060	3,000
VOLUME RATIO (VR) ....	0.17	0.80
WEAVING RATIO (R) ....	0.31	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH BOTH PKWY & TRANSWY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,980	5,187	is the nonweaving vehicles on the freeway
V 2	868	904	is the down weaving vehicles
V 3	696	725	is the up weaving vehicles
V 4	124	129	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	45 mph
NONWEAVING VEHICLES	C	48 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	1,626	3,000
VOLUME RATIO (VR) ....	0.23	0.80
WEAVING RATIO (R) ....	0.45	0.50



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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 1997, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	4,848	5,050	is the nonweaving vehicles on the freeway
V 2	432	450	is the down weaving vehicles
V 3	1,060	1,104	is the up weaving vehicles
V 4	96	100	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	47 mph
NONWEAVING VEHICLES	C	52 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****	
WEAVING VOLUME (VW) ..	1,551	3,000	
VOLUME RATIO (VR) ....	0.23	0.80	
WEAVING RATIO (R) ....	0.29	0.50	
WEAVING LENGTH (L) ...	3,650	2,500	*** EXCEEDS MAX



**WEAVING SECTIONS ON US-101  
NORTHBOUND  
(PM PEAK HOUR)**

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**YEAR 2010**

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITHOUT PKWY OR TRANSWY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	7,364	7,670	is the nonweaving vehicles on the freeway
V 2	1,040	1,083	is the down weaving vehicles
V 3	348	362	is the up weaving vehicles
V 4	48	50	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	47 mph
NONWEAVING VEHICLES	C	52 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED  
 \*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,443	3,000
VOLUME RATIO (VR) ....	0.16	0.80
WEAVING RATIO (R) ....	0.25	0.50

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITHOUT PKWY OR TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	7,408	7,716	is the nonweaving vehicles on the freeway
V 2	1,264	1,316	is the down weaving vehicles
V 3	1,432	1,491	is the up
			LOS SPEED
			*** *****
WEAVING VEHICLES			D 40 mph
NONWEAVING VEHICLES			E 40 mph

 -----

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	2,803	3,000
VOLUME RATIO (VR) ....	0.26	0.80
WEAVING RATIO (R) ....	0.47	0.50
WEAVING LENGTH (L) ...	2,460	2,500

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITHOUT PKWY OR TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

## C) INPUT VOLUMES

VOL	(vph)	(pcph)	DESCRIPTION
V 1	7,504	7,816	is the nonweaving vehicles on the freeway
V 2	612	637	is the down weaving vehicles
V 3	96	100	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	47 mph
NONWEAVING VEHICLES	C	51 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	736	3,000
VOLUME RATIO (VR) ....	0.09	0.80
WEAVING RATIO (R) ....	0.14	0.50



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH MCINNIS PKWY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,620	6,895	is the nonweaving vehicles on the freeway
V 2	900	937	is the down weaving vehicles
V 3	284	295	is the up weaving vehicles
V 4	40	41	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,231	3,000
VOLUME RATIO (VR) ....	0.15	0.80
WEAVING RATIO (R) ....	0.24	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH MCINNIS PARKWAY ONLY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,636	6,912	is the nonweaving vehicles on the freeway
V 2	1,056	1,100	is the down weaving vehicles
V 3	812	845	is the up weaving vehicles
V 4	128	133	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	D	42 mph
NONWEAVING VEHICLES	D	44 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	1,942	3,000
VOLUME RATIO (VR) ....	0.22	0.80
WEAVING RATIO (R) ....	0.43	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH MCINNIS PKWY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,408	6,675	is the nonweaving vehicles on the freeway
V 2	564	587	is the down weaving vehicles
V 3	660	687	is the up weaving vehicles
V 4	60	62	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	47 mph
NONWEAVING VEHICLES	C	51 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	1,272	3,000
VOLUME RATIO (VR) ....	0.16	0.80
WEAVING RATIO (R) ....	0.46	0.50

1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/LAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH TRANSITWAY ONLY

A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,768	7,050	is the nonweaving vehicles on the freeway
V 2	956	995	is the down weaving vehicles
V 3	304	316	is the up weaving vehicles
V 4	44	45	is the ramp-to-ramp nonweaving vehicles

 -----

D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,310	3,000
VOLUME RATIO (VR) ....	0.16	0.80
WEAVING RATIO (R) ....	0.24	0.50

\*\*\*\*\*

FACILITY SECTION... US-101 NORTH - SOUTH SR37/NOVATO BLVD  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-23-1988  
 MISC.INFO..... YEAR 2010, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,636	6,912	is the nonweaving vehicles on the freeway
V 2	1,056	1,100	is the down weaving vehicles
V 3	812	845	is the up weaving vehicles
V 4	128	133	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 4  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	D	40 mph
NONWEAVING VEHICLES	E	40 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED *****	MAXIMUM *****
WEAVING VOLUME (VW) ..	1,942	3,000
VOLUME RATIO (VR) ....	0.22	0.80
WEAVING RATIO (R) ....	0.43	0.50
WEAVING LENGTH (L) ...	2,460	2,500



1985 HCM: WEAVING AREAS

PAGE 1

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH TRANSITWAY ONLY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	6,604	6,879	is the nonweaving vehicles on the freeway
V 2	580	604	is the down weaving vehicles
V 3	92	95	is the up weaving vehicles
V 4	8	8	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	48 mph
NONWEAVING VEHICLES	C	53 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	698	3,000
VOLUME RATIO (VR) ....	0.09	0.80
WEAVING RATIO (R) ....	0.14	0.50



1985 HCM: WEAVING AREAS

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FACILITY SECTION... US-101 NORTH - SOUTH NAVE DR. EXIT  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,992	6,241	is the nonweaving vehicles on the freeway
V 2	816	850	is the down weaving vehicles
V 3	260	270	is the up weaving vehicles
V 4	36	37	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 4810  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
	***	*****
WEAVING VEHICLES	C	49 mph
NONWEAVING VEHICLES	B	54 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
	*****	*****
WEAVING VOLUME (VW) ..	1,119	3,000
VOLUME RATIO (VR) ....	0.15	0.80
WEAVING RATIO (R) ....	0.24	0.50

1985 HCM: WEAVING AREAS

PAGE 1

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FACILITY SECTION... US-101 NORTH - SOUTH SR-37/NOVATO BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,932	6,179	is the nonweaving vehicles on the freeway
V 2	1,040	1,083	is the down weaving vehicles
V 3	708	737	is the up weaving vehicles
V 4	124	129	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 2460  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	D	43 mph
NONWEAVING VEHICLES	D	45 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW) ..	1,817	3,000
VOLUME RATIO (VR) ....	0.22	0.80
WEAVING RATIO (R) ....	0.41	0.50

1985 HCM: WEAVING AREAS

PAGE 1

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FACILITY SECTION... US-101 NORTH - SOUTH ROWLAND BLVD.  
 ANALYST..... MJS/BAG  
 TIME..... PM PEAK HOUR  
 DATE..... 6-22-1988  
 MISC.INFO..... YEAR 2010, WITH BOTH PKWY & TRANSWY

## A) ADJUSTMENT FACTORS

-----  
 PERCENTAGE OF TRUCKS..... 5 (TYPICAL - 200 #/HP)  
 PERCENTAGE OF BUSES..... 1  
 PERCENTAGE OF RECREATIONAL VEHICLES... 0  
 PEAK HOUR FACTOR..... 1  
 DRIVER POPULATION FACTOR..... 1 (WEEKDAY/COMMUTER)  
 LANE WIDTH (FT)..... 12  
 OBSTRUCTIONS ON BOTH SIDES  
 DISTANCE FROM ROADWAY EDGE (FT)..... 6

## B) CORRECTION FACTORS

-----  

TERRAIN TYPE	E T	E B	E R	f HV	f w	f p
LEVEL	1.7	1.5	1.6	0.96	1.00	1.00

 -----

## C) INPUT VOLUMES

-----  

VOL	(vph)	(pcph)	DESCRIPTION
V 1	5,680	5,916	is the nonweaving vehicles on the freeway
V 2	492	512	is the down weaving vehicles
V 3	1,072	1,116	is the up weaving vehicles
V 4	92	95	is the ramp-to-ramp nonweaving vehicles

 -----

## D) ANALYSIS RESULTS

-----  
 WEAVE TYPE..... B  
 NO. OF LANES..... 5  
 LENGTH OF SECTION..... 3650  
 NO. OF MAINLINE LANES..... 4  
 (Upstream of Weave Section)

	LOS	SPEED
WEAVING VEHICLES	C	46 mph
NONWEAVING VEHICLES	C	51 mph

OPERATION OF WEAVING AREA IS UNCONSTRAINED

\*\*\*\*\*

	ANALYZED	MAXIMUM
WEAVING VOLUME (VW) ..	1,626	3,000
VOLUME RATIO (VR) ....	0.21	0.80
WEAVING RATIO (R) ....	0.31	0.50



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## CULTURAL RESOURCES EVALUATION





**CULTURAL RESOURCES EVALUATION  
FOR THE HAMILTON FIELD EIR,  
CITY OF NOVATO, MARIN COUNTY, CALIFORNIA**

**Prepared for:**

**EIP Associates  
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San Francisco, California 94103**

**June 1986**



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*Cultural Resources Consultants*



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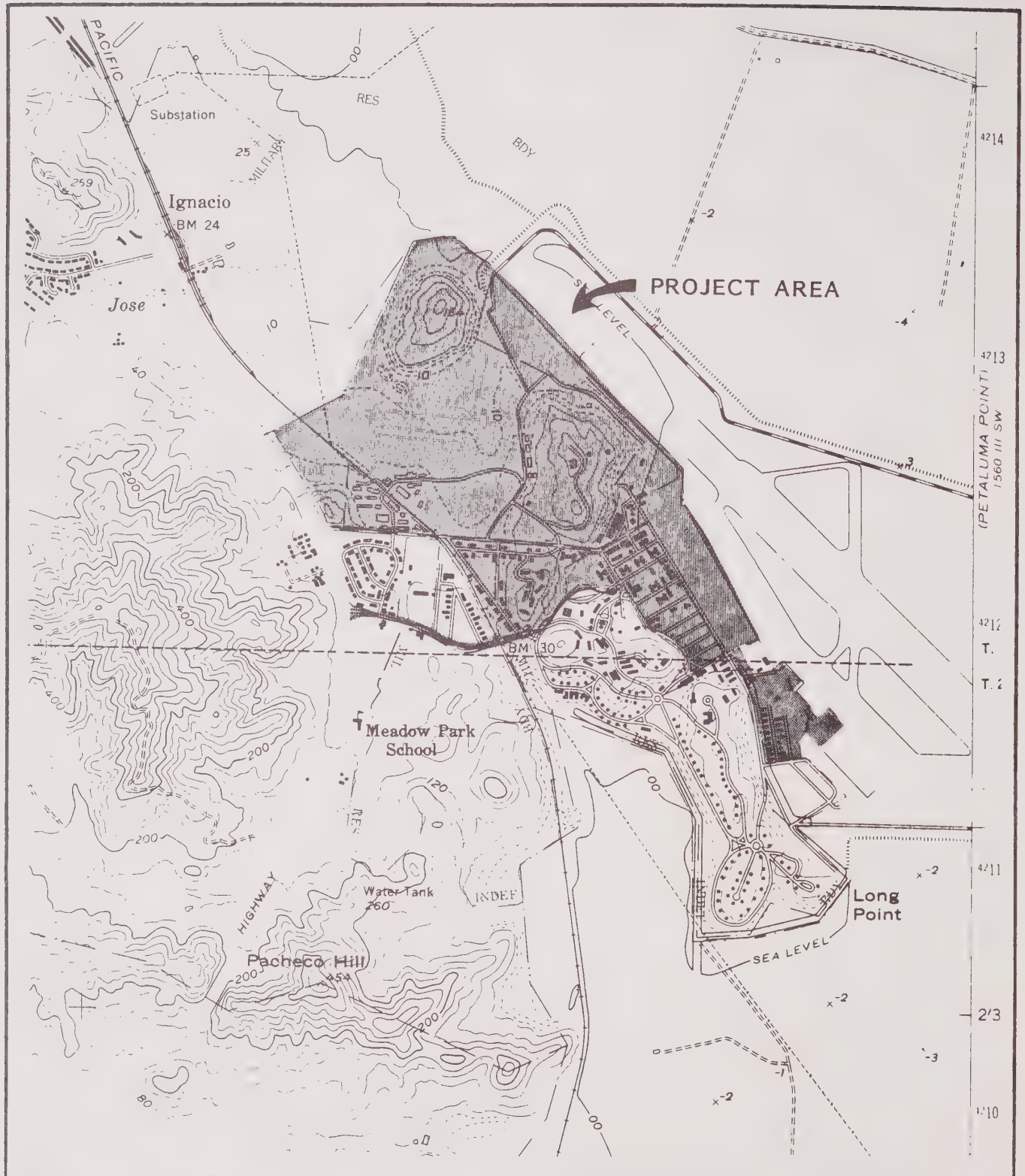
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## INTRODUCTION

The City of Novato is requesting that an Environmental Impact Report (EIR) be prepared for the Hamilton Field Master Plan proposal. The Berg-Revoir Corporation has purchased 402 acres of the 1,6000 acre surplused military property from the General Services Administration (see Map 1). The Master Plan proposal, encompassing the southernmost parcel in the City of Novato, would require a General Plan amendment and Master Plan approval from the City of Novato.

The size of the project site and its varied topography would permit an uncommon mixture of land uses. The Master Plan calls for the provision of 2,000 moderate income rental apartments, 500 Senior Citizen rental apartments, hotel/conference center, hospital/medical center, two centers of retail/commercial services, 1,475,000 square feet of office space, 1,500,000 square feet of research and development space, 525,000 square feet of hangar and warehousing space and supporting recreational facilities, educational/cultural facilities. The project would be constructed over about a ten year period.



PROJECT LOCATION MAP 1

SOURCE: USGS Novato, Calif., 7.5' Quad, 1954 (photorevised 1980)





## CULTURAL RESOURCES SETTING

The cultural resources investigations for the Hamilton Field EIR property were initiated by reviewing in-house maps, files and records, which indicate the location and nature of known and recorded cultural resources in the general Hamilton Field area. Also, a similar literature review was accomplished at the California Archaeological Inventory Northwest Information Center at Sonoma State University. In addition, the National Register of Historic Places and the California Inventory of Historic Resources were also consulted. Cultural resources personnel at various agencies were contacted regarding the management of known and potential resources within the project area. Further, the American Indian Council of Marin, in San Rafael, and the Native American Heritage Commission, in Sacramento, were also consulted.

The data review and consultation process has resulted in these setting discussions.

### Ethnographic Setting

At the time of European contact, Marin County and the southern portions of Sonoma County were occupied by the Coast Miwok. This groups is one of seven dialect groups of the Miwok, which is one of the five major languages of the Penutian language family. The community organization was presumably based on a non-egalitarian system, with three highly ranked individuals holding status positions (Kelly 1978:419). Each tribelet maintained at least one year-round principal village with permanent structures and residents. Along the bayshore the major villages were situated adjacent to the edge of the estuary with seasonal villages in the surrounding hills (Kroeber 1970: 273; Slaymaker 1977). Conical, grass-thatched, semi-subterranean dance houses and men's sweathouses were located at these major villages. Living quarters were small, conical, grass-thatched lodges constructed on a bent poles framework.

Each tribelet maintained subsidiary or seasonal villages and camps which they used during their seasonal round of hunting and gathering. The diversified

environments and resources available in the Hamilton Field area provided an excellent subsistence base for the hunting and gathering prehistoric and ethnographic peoples of the area.

The Coast Miwok used digging sticks, baskets, bow and arrows, spears, traps, snares and nets to successfully procure a vast array of food and natural resources that they used in their daily lives. Along the bayshore and freshwater channels, salmon, steelhead, perch, shark, oysters, mussels, clams, eels, crabs and a wide range of waterfowl were obtained. In the foothills and along the steam banks of the bayshore fronting valleys, deer, elk, bear, jackrabbit, cotton-tail rabbit, squirrels, quail, mourning doves and other birds were abundant.

Baumhoff (1963) lists fish, game animals and acorns as the three main food staples in the prehistoric diet. Acorns were as readily available to the Coast Miwok as were fish and game animals, and the two preferred species of tanbark oaks and valley oaks are abundant in Marin County. The oak savannahs also provided an ideal habitat for many of the nuts, berries and herbs used by the Coast Miwok (Kelly 1978). Buckeyes, brodiaea, willows, iris, soaproot and other berries, annuals, herbs and grasses were abundant in the Hamilton Field environs.

Evidence of prehistoric and ethnographic tools and features which were used in the procurement and processing of these varied resources are found throughout the cultural deposits associated with sites located throughout the project area.

With the arrival of Europeans in the San Francisco Bay Area, the Coast Miwok life style rapidly disintegrated and the population became dislocated. In 1776 Mission Dolores was founded in San Francisco and the enslavement of native populations by the mission system began, which resulted in a tremendous depopulation and relocation of the Coast Miwok peoples. The introduction of European diseases by the early settlers resulted in massive epidemics of measles, smallpox and syphilis (Kelly 1978; Goerke and Cowan 1983:15). Secularization of the mission system in 1834 was the final step in dislocation of the native population. The Indians had become dependent on the missions

for a livelihood and with secularization little of their native culture remained for them to return to. With the arrival of the American period in 1846 the few remaining Coast Miwok found work in the lumbering, dairying and agricultural endeavors which became prevalent in Marin County. Kelly (1978: 414) states that by the 1930s the Coast Miwok culture was extinct; however, some Native Californians who have Coast Miwok ancestry remain in the Marin-Sonoma Counties area.

### Prehistoric Setting

In the early 1900s archaeologists and anthropologists at the University of California, Berkeley, became concerned about the future of the rapidly disappearing shellmounds located around San Francisco Bay. Soils from many sites in Marin were being used as fill materials and road base throughout the county and in the 1860s the San Rafael-San Quentin Road was constructed using soils from local Indian shellmounds (Goerke 1974:2). Between 1906 and 1908, N. C. Nelson conducted the first archaeological survey of the Bay Area and over three hundred shellmounds were recorded during that time, including many in Marin (Nelson 1909, 1910, 1911). Several of the Hamilton Field archaeological sites were recorded at that time.

As more sites were excavated throughout Central California in general, it became evident that there was time depth and cultural change in the archaeological record. Change through time became a theoretical research consideration which resulted in various attempts to organize the recovered cultural data into a workable framework so that questions of culture change, time depth, social organization and trade systems could be formulated. Lillard, Heizer and Fenenga (1939) used burials with grave goods to subdivide Central California prehistory into an Early, Middle and Late Horizon. More recent work throughout California has resulted in the subdivision of these periods into locale facies or phases. Recent models suggested by Fredrickson (1974) use a broader base with the Middle Archaic Period (3000 to 1000 B.C.) and the Upper Archaic Period (1000 B.C. to A.D. 500). The McClure Facies and Ellis Landing Facies would fall into the Middle Archaic which is characterized as a period of considerable diversity, cultural variation and population movements. The Upper Archaic is typified by socio-political



complexity, ranked society and more sophisticated trade networks with shell beads serving as indicators of exchange and status (Goerke and Cowan 1983:2).

The greater Hamilton Field locale was densely occupied by native populations during prehistoric times and numerous archaeological sites are recorded in the area. Five sites located along the Bay side of Marin County have been selected as representative of the work done in the greater project area region and are summarized below.

CA-Mrn-158, which is located adjacent to Hamilton Field property, approximately 0.5 mile from the project area, was tested by Treganza and McBeath in 1963; the site was again tested by Selby in 1969. Three flexed burials, without associated goods, were removed from that midden. The recovered artifacts included shaped and incised pieces of baked clay; shaped and cobble mortar fragments; an antler wedge; bone splinter awls; a scapula saw; bird bone beads; and large, leaf-shaped obsidian points. Selby, in a one-page report (1969), speculated that CA-Mrn-158 contained evidence of both Middle and Late Horizon settlements (Moratto et al. 1974).

In 1969, CA-Mrn-168, which is located in Ignacio, approximately 0.4 mile west of the project area, was excavated by Melander and Slaymaker. At least eight burials were recorded, most of which appeared to be flexed. Among the recovered artifacts were imperforate cylindrical and plummet charmstones; pestles; large and small shaped mortar fragments, lanceolate and leaf-shaped obsidian points (like Beardsley's 1954 N-2 and N-4 series); small, corner-notched and side-notched obsidian arrow points; bone strigils, ulna tools, awls and needles; antler wedges; decorated clay objects; and Olivella beads of the saucer, split-drilled, modified saddle, and amorphous types, along with two clam shell disc beads (Melander and Slaymaker 1969: 18-31). It was concluded that CA-Mrn-168 was occupied principally during the Middle Horizon, but also infrequently during the Late Horizon, by people whose economy was focused upon shellfish collecting, hunting and the gathering of acorns and other seeds (Melander and Slaymaker 1969:33-34).

The San Jose village site, CA-Mrn-7, was excavated by Jackson in 1972. The site was located at the upper end of the Arroyo San Jose drainage, approximately 2.5 miles northwest of the project area. Jackson describes the CA-Mrn-7 artifact assemblage as consisting of Olivella thin-lipped, full-lipped, spire-lopped and rectangle beads, clam shell disc beads, Haliotis subrectangular ornaments, mussel shell spoon fragments; bone awls, saws and tubes; modified stingray barbs; generalized chert flake tools; obsidian bipoints and a variety of obsidian arrowpoints, usually triangular, both corner-notched and side-notched and both even-edged and serrated; a variety of mortar and pestle fragments; and steatite beads and pipes (Jackson 1974:1-22). In his conclusions, Jackson remarks that:

The artifactual material recovered from the site to date bears a striking resemblance to the artifacts inventory from the recently reported sites on Limantour Estero, this even more so than with any other sites known to the author in Marin County. Temporal affinities are strongly suggestive of a Phase 2, Late Horizon occupation period. Olivella bead types (E1 and E2), steatite beads (A1c, C1b, D1a), clam disc beads, and small "arrow points" are all evidence of Phase 2 occupation. In addition, the practice of cremation at the site is indicative of a Late Horizon occupation. San Jose Village is unique in the presence of at least four major structures at the site. The absence of human remains is also intriguing, suggesting either that off-site cemeteries existed, or that the site was a "special purpose" site of some sort... Trade relationships (with areas to the north, east, and west) are far ranging as indicated by the variety of raw materials found as artifacts at the site (Jackson 1974:24).

The Pacheco Ranch site, CA-Mrn-152, is located in Pacheco Valley, approximately 1.25 miles southwest of the project area, and excavations of the site were conducted in the 1970s. Goerke and Cowan (1983:53-62) summarize their findings at CA-Mrn-152 as follows:

Based on artifacts alone, Pacheco Ranch appears to have been the site of a predominately Middle Horizon occupation with an Early transitional period and a Late component. Artifact assemblages at CA-Mrn-152 strongly resemble the McClure and Ellis Landing Facies. Utilized flakes are the most common form of tools present along with drills, bifaces, scrapers, projectile points, mortars and bone awls. Carbon-14 dates of 3270+ 70 B.P. and 3050+ 130 B.P. for the site and time sensitive artifacts, seem to indicate that the site was occupied for a relatively long period before and after these dates.

CA-Mrn-170 is located in Ignacio, approximately 0.5 miles north of the project area and was reported on by Chavez (1976). Time sensitive artifacts assemblages from the site indicate that this bayshore shellmound was occupied from the late part of the Middle Horizon up to the early nineteenth century. Two carbon-14 dates of A.D. 600 and A.D. 1530 confirm occupation during the Phase 1 and 2 of the Late Horizon. The site is located close to the Bay adjacent to marshland with sturgeon, bat ray, shark, deer, jackrabbit, cotton-tail rabbit, rodents and shellfish remains common. The predominant tool types are again utilized flakes, scrapers, bifaces, drills, projectile points, mortars and bone awls.

The information available from these past studies in the Hamilton Field region lead to the conclusion that the general study area environment was an important prehistoric habitation and utilization locale. The archaeological evidence suggests that this region was occupied as early as 3625 B.C. and was likely continuously occupied by indigenous populations up until the historic period and as late as the post-mission era (mid-1800s).

### Archaeological Setting

As previously discussed, early in this century Nelson recorded a number of archaeological sites in the Hamilton Field region. According to the records maintained at the Northwest Information Center, three such resources (CA-Mrn-149, -160 and -161) are actually located within the Hamilton Field military reserve boundaries (see Map 2). Other sites (CA-Mrn-151, -158 and -170) are located adjacent to the reserve boundaries.

In 1976 Archaeological Consulting and Research Services, Inc. (ACRS) reported on survey work for areas proposed for ownership change at Hamilton Field; the objectives of that study were to relocate previously identified Nelson sites and to locate any previously unrecorded resources within specific parcel boundaries. The ACRS study resulted in the identification of two possible locations for CA-Mrn-149 (one of which was the reported location of the plaque-bearing boulder at North Circle), the identification of an unrecorded site area at Long Point and an area identified as Site C which is located between Buildings 310 and 307 (see Map 2). ACRS reported that



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CA-Mrn-160 could not be located and was likely situated outside the 1976 study parcel boundaries. It was further reported that ACRS found no archaeological deposits at the recorded location of CA-Mrn-161 and suggested that Site C, where archaeological remains were observed, was the actual location of Nelson's CA-Mrn-161.

A review of the 1976 ACRS report by Sonoma State University Archaeologist David A. Fredrickson (letter dated February 14, 1979) concurred in the ACRS findings and recommendations that the Site C location be subjected to archaeological testing and significance determination in the event that that area is potentially subject to disturbance. Also, Fredrickson recommended that although it appears that no archaeological remains exist at the recorded CA-Mrn-161 location, some protective measures would be appropriate for that area as well.

In 1980, the reported location of Site C was the subject of subsurface archaeological investigations by Baker and Salzman. That work, which was conducted for the Interagency Archaeological Services in San Francisco, consisted of an auger boring program and the excavation of a single 1 meter x 1 meter test unit in the reported location of Site C. Those archaeological investigations resulted in the following conclusions:

Augering and test excavation at Site C, Hamilton Air Force Base, produced no evidence of any intact cultural deposit. Whether the sparse cultural materials located at this locus were derived from other areas as top soil fill, or are the remains of in situ and destroyed deposits, insufficient evidence exists to support any consideration of this "site" as a significant resource. The criteria for nomination to the National Register of Historic Places have not been met, and it has been determined that no cultural resource, eligible or otherwise, appears to exist at this location (Baker and Salzman 1980:11).

The latest review of the Hamilton Field cultural resources was accomplished by Holman and Associates (letter report dated November 25, 1985), in which Holman reports that in telephone conversations with Jackson of ACRS, it was learned that ACRS never specified where Site C midden could be found nor what the presumed limits of that deposit might be. In Holman's field review of the site area, he observed barbed wire fencing at ground level; this was apparently used by Baker and Salzman (1980) in determining the extent of

the area to be tested. Holman's conversations with Jackson revealed that ACRS never delineated such boundaries for the deposit and it was assumed that someone from Hamilton Field had arbitrarily placed the barbed wire around the area for protection. Holman concluded that the wire fence can not be taken as an indicator of the upslope limits of the midden nor can the retaining wall and parking lot be used to mark the downslope limits of the potential limits of archaeological sensitivity.

The review of these various cultural resources assessments led to the following assumptions regarding the archaeological sensitivities for the presently defined Hamilton Field study area:

- . The ACRS Site C location has been subjected to subsurface archaeological testing (Baker and Salzman 1980). While that testing program was appropriate and well executed, it is concluded that by limiting the investigation to the arbitrary boundaries of the ground level barbed wire, the full potential of subsurface archaeological sensitivity was not explored; this is concluded particularly in light of Holman's (1985) conversations with Jackson regarding the lack of definition as to the potential site boundaries.
- . No evidence of archaeological deposits have been observed at Nelson's CA-Mrn-161 location; however, a degree of subsurface sensitivity cannot be overlooked at that area.
- . The Nelson site, CA-Mrn-160, has not been located and its relationship to the current project boundaries remains uncertain.
- . The two potential locations for CA-Mrn-149 are situated outside the current project boundaries and are not regarded as potentially effected resources.

### Historical Setting

Hamilton Field is situated on land which was at one time part of Ignacio Pacheco's "Rancho de San Jose." Ignacio Pacheco, born in Santa Clara

County in 1808, was raised in San Jose and by the age of nineteen had enlisted in the Mexican Army. It was from his post in the Presidio of San Francisco that Pacheco, in 1834, first visited Marin. Attracted to a parcel of land bordered by redwoods and San Pablo Bay, by 1838 Pacheco had initiated a claim, settled on the land, built a home and corral and was raising livestock. Pacheco's Rancho de San Jose (named in honor of both his deceased wife's patron saint and his place of birth) consisted of 6,659 acres, and was bound by Rancho Las Gallinas to the south, Rancho Nicasio to the east, Rancho Novato to the north and San Pablo Bay and Pacheco Point to the east. On October 6, 1840, Governor Juan B. Alvarado approved the land grant and within six years, Pacheco had become the first Alcalde of San Rafael (ECHO 1973:4; Mason 1971:87-88).

In 1848, with the acquisition of California by the United States, many Mexican land grants were challenged in the courts. Pacheco was, thus, forced to refile a claim for his land in 1852. Approved by the Land Commission in 1853 and later in 1857 by the District Court, Pacheco's claim was challenged; however, this challenge was dismissed and on May 14, 1861, Pacheco received a United States patent for Rancho de San Jose. Three years later, in 1864, Ignacio Pacheco, who was to be "remembered as a man who used his influence for the best interest of the town, county, and state," died at his home in Marin County (Mason 1971:88; ECHO 1973:4).

Pacheco's three marriages produced nine children, and upon his death one-third of his land went to his widow, Maria, while the remainder was divided equally among his children. His daughter, Catalina, from his last marriage, also received the family hacienda. By the 1880s the ranch boasted orchards, vegetable gardens, barns, as well as large cattle herds. The Northwest Pacific Railroad depot, which was located near Highway 101, and torn down in 1962 in order to widen the highway, served as the terminus for transporting cattle from the ranch to market. The ranch abounded with wildlife and was considered a great hunting area. Fine horses were raised by the Pacheco family, and present-day Meadow Park School is located on what was once the ranch's race horse exercise track (ECHO 1973:4).



Over the years, much of the ranch land was sold and subdivided or lost to banks; however, some remained in the hands of the Pacheco family. Ignacio's eldest son, Gumescendo, built his home, in 1881, on property lying between St. Vincent's Hill and Ignacio. His home can still be seen on Alameda del Prado, across the highway from Hamilton Air Force Base and as late as 1975 his grandson, Herbert Rowland, Sr., was living in the home. The house Catalina had inherited remained in her family's possession until it was lost through bad management. It was destroyed by fire on May 23, 1916. Part of the foundation of the adobe hacienda can still be seen lying 100 feet southeast of Galli's Restaurant at 350 Ignacio Boulevard (closed in 1985) and the restaurant's tree-lined drive served as the original lane leading to the Pacheco home (ECHO 1973:4; Marin Journal 1941; Independent Journal 1983:A4, 1975:B5; Teather 1974:82).

By the late 1920s, the Marin Meadow region of Pacheco's former ranch was in the hands of the California Packing Company and in 1929, after a tour of the Pacific coast, U.S. government inspectors choose that area as the site for a new Army airfield. With the country in the throngs of depression, the Marin County Board of Supervisors welcomed the military presence which was seen as a boom to business, as well as a means of reducing unemployment in the region. Economically motivated, the Supervisors proposed purchasing the 776 acres and then giving the land to the Army for their airfield. The people of Marin evidently agreed for they voted to increase their taxes in order to raise the \$121,000 it would cost to buy Marin Meadows. One-hundred-and-sixty-one acres were later added and on March 17, 1932, the community handed the deeds to the land over to the U.S. Army (Independent Journal 1976:M2; Mason 1975:168).

Construction at Hamilton Field began in 1931, under the engineering supervision of Captain Howard B. Nurse. In keeping with traditional California-Spanish architecture, Nurse envisioned a base of white stucco buildings with red tiled roofs; a base which would be the most beautiful and best operated in the Army Air Corps. Initially, tidal marshlands were drained and diked, as part of the field was below sea level. Two years later, even before the base was completed, the 7th Bombardment Group arrived. On May 12, 1935, formal dedication ceremonies were held at Hamilton Field, named posthumously

after Lt. Lloyd A. Hamilton, a flier killed during World War I (Mason 1975: 168-169; Independent Journal 1976:M2; Barry 1975:6).

After seven years as a bomber base, the 7th Bombardment Group was relocated to Utah in 1940, and replaced by the 20th and 35th Pursuit Groups, the 45th Air Base Group and the 82nd Observation Squadron, as well as support personnel. With the influx of personnel, the base population grew to over 40,000 officers and men and additional housing needs were met by constructing frame barracks which were still in use by the mid-1970s. On September 18, 1947, the United States Air Force was established and the name Hamilton Field was changed to Hamilton Air Force Base. Until 1974 the base would serve as the home of the 904 Tactical Airlift Group, the 452nd Tactical Airlift Wing, the 4661st Air Base Group, the 84th Fighter Interceptor Squadron and the 41st Aerospace Rescue Squadron. In 1974 Hamilton Air Force Base was decommissioned as an active military installation and by 1976 all air force activity had ceased (Barry 1975:6; Greer 1983b:A6; Mohr 1986). For additional information regarding the military history of Hamilton Field, reference is given to Wampler (1964) and the Hamilton Air Force Base pamphlet boxes, both located in the History Room of the Marin County Civic Center Library.

Debate raged for a decade over the fate of Hamilton Field land. Some believed the County should take back the land it had given to the government. Others suggested turning the field into a local airport. By 1980 the voters of Marin had rejected four ballot measures which proposed the development of a solar village, a limited County airport, a large, commercial airport, as well as a bill barring tax expenditure for an airport. By 1983, eighteen-acres of the field, along Highway 101, had been disposed of as Lanham Housing remodeled and converted old structures into homes for 148 moderate-income families, Hamilton School was incorporated into the Novato School District, the Federal Fish and Wildlife Service began utilizing part of Hamilton's undeveloped land, and barracks served as overnight stations for incoming Southeast Asian refugees (Greer 1983a:A6 and 1983b:A8).

By 1985 Hamilton School and the Fish and Wildlife Service still occupied part of the field. Also present were the Navy (which had acquired housing), the



Coast Guard (which ran a search and rescue base) and the Army (which continued to fly helicopters and airplanes from the field). Towards the end of the year the General Services Administration determined to sell over 400 unused acres of Hamilton Field to the highest bidder. The auction was held on March 6, 1985 and on that date the Berg-Revoir Corporation purchased the surplus property (Chan 1985a, 1985b; Leary 1985).

Review of the data for Hamilton Field suggests that potentials for the area are likely limited to the original tile-roofed buildings and features built approximately fifty years ago, which is the time frame for consideration as historically significant resources.

## FIELD INVESTIGATIONS

Prior to initiating our field investigations of the project area, we contacted Ms. Coyote Flower of the American Indian Council of Marin in San Rafael. On Flower's advise we contacted Native American observer Grant Smith from Santa Rosa, who met with the archaeological study team at Hamilton Field; also in attendance at that meeting was R. Paige Talley from the Native American Heritage Commission in Sacramento. At that time, the cultural resources background for Hamilton Field was discussed, as well as our proposed field procedures in re-surveying portions of the project area and conducting subsurface archaeological study of Site C, in supplement to the Baker and Salzman (1980) investigations. It was agreed that G. Smith would provide field monitoring services during the investigation of Site C.

It is noted that the City of Novato Planning Department was consulted regarding compliance with the Novato Cultural Resources Protection Ordinance.

### Field Survey

Since the 1976 ACRS field reconnaissance, no intensive survey work has been accomplished within the project boundaries. While the ACRS field investigations appear to have been thorough, it was determined that a follow-up field review of the area would be an appropriate resource evaluation measure. Within a decade, field conditions and land form configurations could well have changed, thus exposing previously undetected archaeological deposits. The field reconnaissance of the project area was accomplished by associate archaeologists Jack M. Miller and Michael H. Smith, under the supervision of David Chavez. The survey can be described as a very "General Surface Reconnaissance" (King, Moratto and Leonard 1973) in which the more open, accessible terrain was examined for the presence of cultural deposits and features.

During the survey, close attention was given to the detection of those surface features which suggest the presence of prehistoric archaeological resources in this part of Marin County (changes in soil color, composition and/or texture which suggest the occurrence of archaeological midden --

particularly the presence of dark, organic, shell-laden soil; unusual ground contours or abrupt changes in vegetation patterns; the presence of prehistoric stone, shell or bone artifacts; obsidian, chert or other types of lithic flaking wastes; fire-fractured rock, charcoal deposits and/or charred faunal remains). Particular efforts in this regard were concentrated in the general regions surrounding the reported locations of Nelson's CA-Mrn-160 and -161 and ACRS' Site C.

The field reconnaissance of the project area resulted in the following observations:

- . No evidence of archaeological deposits was observed at the reported location of CA-Mrn-160. However, the dense vegetation in that area could be obscuring surface evidence of the site. The mapped location of this resource is given as outside, but immediately adjacent to the current project area boundary. Consequently, while it is likely that this site is located outside the project area, the status of this resource remains uncertain.
- . No evidence of archaeological deposits was detected at the reported location of Nelson's CA-Mrn-161. It was observed that the mapped location of the site consisted of a hillside terrace, which was found to be greatly disturbed due to the past construction of military facilities and a railroad grade. It is concluded that if a site was situated at that location it was destroyed by past land alteration activities.
- . Field review of ACRS' Site C location, in the vicinity of Buildings 310 and 307, resulted in the detection of the very minute presence of shell in a non-midden soil. Similar observations were made by Baker and Salzman (1980) and it would appear that their testing program was concentrated in the area where, sparse as it was, the most surface evidence of an archaeological deposit was present (see Figure 1).

It was determined that because of the uncertain boundaries of the area which was observed by ACRS to contain archaeological remains, it would

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be appropriate to supplement the Baker and Salzman (1980) testing study with additional auger borings.

- . In the course of the field survey, shell-laden, midden-like soil was observed at five additional locations within the project area (see Map 2). All of these areas were situated adjacent to abandoned military buildings in what appeared to have been lawn or garden locations. Preliminary conclusions are that the sparse midden-like soils were imported (likely from one of the Hamilton Field archaeological sites) to enhance the soils in lawn and garden areas. It was, however, concluded that hand augering should be accomplished at these locations so as to verify or refute our surface observations and conclusions for these five locations.

During the field reconnaissance of the project area, efforts were made to detect the presence of potentially significant historic sites, features and structures. With the exception of the white stucco, tile-roofed building and entranceway which date from the original Hamilton Field construction period, no such sites or features were observed. Past cultural resources evaluations of Hamilton Field have suggested that these buildings are of community importance, but not necessarily of great historical significance. Based on the existing historical documentation, it would appear that these buildings have not been evaluated for significance (based on National Register of Historic Places eligibility criteria), by a qualified architectural historian. In light of planned development at Hamilton Field, such a measure may be most appropriate at this time.

### Subsurface Testing

Archaeological testing of the Site C location was initiated by carefully reviewing the Baker and Salzman (1980) report and orienting the report map to observable features at that location. A total of twenty-one borings were excavated with a 4-inch barrel hand auger. Three of the borings were placed within the barbed-wire area previously tested by Baker and Salzman (1980), four auger borings were placed within the parking lot area down-slope and the remaining borings were placed upslope and adjacent to the



previously tested area (see Figure 2). A measured grid pattern was not used in determining the placement of auger borings; rather, the locations were based on general observations in establishing reasonable cover around the Baker and Salzman (1980) testing grid. Most of the auger borings were taken to depths of approximately 80 to 120 centimeters and all soils were passed through a 1/8-inch mesh shaker screen.

The soils which were encountered in the majority of the borings generally corresponded to those reported by Baker and Salzman (1980:4). Topsoils consisted of a medium-brown, dry, silt/sand mixture, with small angular gravels present; in some areas this was overlain by a fill-like soil with large rocks present. Below the topsoil was a layer of darkish-brown sand and below that was a sterile, yellow sandy soil which was assumed to be the underlying marsh subsoil. In those auger borings which exceeded 90 centimeters in depth, grey-brown clays were observed. With the exception of a few shell flakes which were observed in strata near ground surface at borings 15 and 19, no evidence of archaeological deposits was encountered.

Our conclusions regarding ACRS' Site C location are supportive of those presented by Baker and Salzman (1980:11) as follows.

There are two possible interpretations for this site:

1. The shell present in the area has been redeposited from another site. John Dawes, the Assistant Base Manager, mentioned to us (Baker and Salzman) that the area had at one time been used as a nursery and, he believed, topsoil had been brought in. The presence of water pipes also indicates that a garden had been planted in the area. This type of disturbance could account for the abundance of blackberries and thistles in this particular location. The very small size of the shell in the topsoil indicates that the soil may have been tilled to such an extent that the shell became finely ground.
2. There was a prehistoric site at this location which has been thoroughly destroyed. The construction of the fire roads, trench, and nearby parking lot indicates that the site, if there ever was one, may have been destroyed and removed or mixed with later topsoil and recent material. With regard to those potentially fire altered lithics found (by Baker and Salzman), the small trench on the west side of the site was lined with rocks. It is likely that the rocks noted on the surface of the site may have come from this trench.



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The five other areas where midden-like soils were detected (see Map 2) were subjected to very minimal surface testing by placing two auger borings at each of the locations. The borings revealed a uniform stratigraphic pattern at all the areas; that is, sparse, shell-laden, midden-like soil was mixed in the topsoil to a depth of 20 centimeters or less, which was underlain by a sterile, brownish/orange, sandy loam. No evidence of a primary cultural deposit was encountered at any of these locations and it is concluded that the midden-like soils were imported and mixed with existing dirt for purposes of enriching lawn and garden areas. There is no way of knowing where the soils came from; however, it is very possible that they were removed from one of the destroyed Hamilton Field archaeological sites. Whatever the situation, no further archaeological consideration at these locations is required.

## IMPACTS

The archival review and field investigations for the Hamilton Field project area have led to the conclusion that project development plans will have no direct or long-term adverse impacts on any cultural resources which are presently defined as archaeologically or historically significant. The criteria for measuring such significance, by both Federal and State standards, is whether or not a resource is eligible for nomination to the National Register of Historic Places. No archaeological sites or potential site locations were encountered which would possess the depositional integrity, research potential or Native American sensitivity to be considered for such nomination. It is therefore concluded that no presently discernible impacts to archaeological sites will occur, regardless of which alternative land use and development plan for the area is implemented.

As previously discussed, the white stucco, tile-roofed buildings at Hamilton Field have never been evaluated by an architectural historian and, consequently, the historical significance of those structures has never been determined. It is possible that elements of development alternatives could result in impacts, direct and indirect, to some of these structures and the status of their eligibility for protective measures should be determined.

## MITIGATION RECOMMENDATIONS

It is concluded that no adverse impacts to presently known significant archaeological resources will occur as a result of development plan alternatives at Hamilton Field. Consequently, no preconstruction mitigation measures are recommended. However, areas associated with the locations of Nelson's CA-Mrn-160 and -161 and ACRS' Site C cannot be totally dismissed in terms of archaeological sensitivity and potential for rendering some significant information regarding the prehistory of the Hamilton Field area. The following recommendations are therefore presented:

- . CA-Mrn-160 - Despite the field observations which suggest that this site is likely situated outside the project area boundaries, the archaeological sensitivity of that general location remains uncertain. It is therefore recommended that prior to the consideration of any land alteration activities in that immediate area, a follow-up focused resurvey of the terrain take place. That inspection should be accomplished at a time of year when vegetation is not so dense (or following vegetation removal) so that thorough ground inspection is possible. Should evidence of the site be detected within the project area boundaries, then appropriate archaeological measures can be taken to determine the extent and nature of the deposits and the significance of the resource. Impact and mitigation evaluations could then be developed in relation to the proposed land use plan. All such procedures should be accomplished in full consultation with the local Native American community and in compliance with appropriate State and Federal requirements.
- . CA-Mrn-161 - Field observations strongly suggest that no archaeological deposits exist at the mapped location of this Nelson site. However, if a resource did exist at one time in that area it is possible that subsurface remnants of the site are present somewhere in the immediate vicinity. It is therefore recommended that if land alternation activities are ever scheduled for that location, the construction be monitored by a qualified archaeologist and a Native American consultant. Should buried archaeological deposits be encountered at that time, work should cease in the vicinity of the find so that proper evaluations can be made.

- . Site C - The subsurface testing of this area has greatly diminished the archaeological sensitivity of the ACRS site location. However, if a site did at one time exist in that area, it is possible that isolated prehistoric features or artifacts may still be located somewhere in the area. It is therefore recommended that if land alteration work is considered for that location, a qualified archaeologist and Native American consultant monitor the construction activities. Similar evaluation consideration, as presented for CA-Mrn-160 and -161, would be recommended.

The fact that no additional ground surface evidence of archaeological deposits was observed within the project area does not preclude the possibility that archaeological remains exist anywhere below the ground surface at Hamilton Field and could be encountered during any subsurface construction activities associated with the various development alternatives. In the event that archaeological remains are encountered during project area development, it is recommended that land alteration work in the general vicinity of the find be halted and a qualified archaeologist consulted. Prompt evaluations could then be made regarding the finds, local Native American organizations consulted and a course of action acceptable to all concerned parties could then be adopted.

In regard to the discovery of subsurface cultural remains, it is noted that in consulting with G. Smith regarding the archaeological resources of Hamilton Field, and Marin County in general, specific issues concerning the disposition of Native American burials and artifacts were discussed. Smith expressed great concern for the protection of burial remains and associated cultural materials which could be encountered anywhere in the Hamilton Field project area where subsurface construction activities might occur. It is therefore recommended that the following specific procedures be implemented in the event that such remains are encountered:

- . Adherence with California Senate Bill 297 should be strictly observed. In the event that Native American burial remains are discovered, the County Coroner, the Native American Heritage Commission and American Indian Council of Marin should be contacted.

- . Under no circumstances should construction personnel or others disturb or remove any burial materials or artifacts; only a qualified archaeologist who had consulted with the above parties should deal with those remains.
- . The implementation of a very specific management program which is developed between the project proponent, the American Indian Council of Marin and the consulting archaeologist would be required prior to proceeding with the project. Such a program should include explicit language regarding the disposition of burial materials and artifacts.

In regard to potential historic resources, it is recommended that an architectural historian evaluate the significance of the white stucco, tile-roofed buildings within the Hamilton Field project area. At that time, if a finding of significance is established, then impact and mitigation evaluations can be developed in response to development alternatives. It is likely that preservation of significant buildings and structures would be an acceptable form of mitigation if any adverse effects are anticipated.



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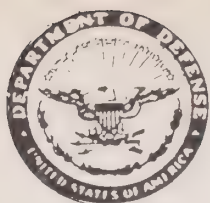
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U.S. ARMY CORPS OF ENGINEERS,  
404 JURISDICTIONAL DETERMINATION







DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS  
211 MAIN STREET  
SAN FRANCISCO, CALIFORNIA 94105 - 1905

Regulatory Functions Branch  
No. 16353N83

FEB 3 1986

RECEIVED  
MAR 28 1986  
EIP

Mr. James Revoir  
Berg-Revoir Corporation  
Hamilton Field  
500 Palm Drive  
Novato, CA 94947

Dear Mr. Revoir:

This is in response to your request, dated October 7, 1985, for a jurisdictional determination for a parcel of land (formerly a part of Hamilton Air Force Base) bounded by Nave Drive to the west, the Hamilton Air Force Base airstrip to the east, State Access Road to the south, and Pacheco Pond to the north, in the city of Novato, Marin County, California.

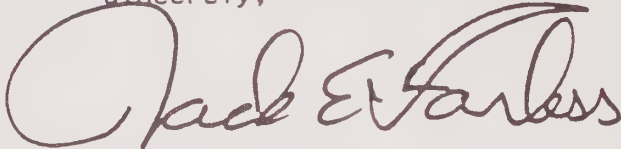
All proposed discharges of dredged or fill material into "waters of the United States" require Corps of Engineers authorization under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344). "Waters of the United States" include, but are not limited to, coastal and inland waters, lakes, rivers and streams that are navigable waters of the United States, including adjacent wetlands; tributaries to "navigable waters of the United States," including adjacent wetlands; interstate waters and their tributaries, including adjacent wetlands; and all other waters of the United States.

On the enclosed topographic drawing, we have delineated the Section 404 areas in red. Of the total 402 acre site, 23.62 acres (indicated in red) would require a Section 404 permit. Application for Corps authorization should be made to this office using the application form in the enclosed pamphlet. The application must include plans showing the location, extent and character of the proposed work and/or structure, prepared in accordance with the requirements contained in this pamphlet. You should note, in planning your work, that upon receipt of a properly completed application and plans, we are required to advertise the proposed work by issuing a public notice for a period of 30 days.

Please note that based on recent revisions to the Corps of Engineers regulations (33 CFR 320.4(a)(1)), it will be necessary for you to demonstrate to the Corps that your proposed fill is necessary because there are no practicable alternatives, as outlined in the U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines. A copy is enclosed to aid you in preparation of this alternative analysis. Be aware that failure to satisfy the 404(b)(1) Guidelines will require denial of your application for a Corps permit.

If you have any questions, please call Mr. Darwin Helmuth of our Regulatory Functions Branch (telephone 415-974-0418). Please address correspondence to the District Engineer, Attention: Regulatory Functions Branch, and refer to the file number at the head of this letter.

Sincerely,

A handwritten signature in dark ink, reading "Jack E. Farless". The signature is fluid and cursive, with a large initial "J" and "F".

Jack E. Farless  
Chief, Construction-Operations  
Division

Enclosures

Copy furnished w/encl

US F&WS, Sacramento, CA  
US EPA, S.F., CA  
US NOAA, Tiburon, CA  
CA F&G, Yountville, CA  
CA RWQCB, Oakland, CA  
Leslie Carmichael, Novato, CA

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A QUALITATIVE FISHERIES SURVEY  
OF PACHECO CREEK, NOVATO, CALIFORNIA



A QUALITATIVE FISHERIES SURVEY OF  
PACHECO CREEK, NOVATO, CALIFORNIA

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April 10, 1988

## I. INTRODUCTION

Although anadromous salmonids have been observed in the Flood Control Ponds at the confluence of Pacheco Creek, Arroyo San Jose Creek and Novato Creek in Novato, there is very little fishery resource survey information on Pacheco Creek. In response to the DEIR for the Hamilton Field Project, the California Department of Fish and Game and the National Marine Fisheries Service expressed some concern regarding possible impacts of the Project on anadromous salmonids. Therefore, a reconnaissance-level fisheries investigation was conducted in Pacheco Creek with the following two objectives:

- (1) To evaluate salmonid habitat; and,
- (2) To determine whether or not anadromous salmonids were present.

The results of the survey will be incorporated into the FEIR for the Hamilton Field Project.



## II. METHODOLOGY

On April 5, 1988, Dr. Alice A. Rich of A. A. Rich and Associates conducted a reconnaissance-level fisheries survey on Pacheco Creek, Novato, Marin County<sup>1</sup>. The habitat portion of the survey consisted of spot checks of the lower section of Pacheco Creek, a drive to the top of "Ammo Hill" for an excellent view down on the Creek within the Hamilton Field area, walking the Creek from Main Entrance Road up to Highway 101, and spot checks of the Creek west of Highway 101 (Figure 1). In addition to the habitat survey, two sites (one below and one above Bolling Road) were electrofished. These sites were representative of pool environments which might have salmonids in them.

Due to the spot-check nature of the April 5 survey between the Flood Control Pond and State Access Road and the stretch of Creek west of the freeway, I decided to walk these sections two days later. The purpose of this endeavor was to determine whether or not there were any migration barriers in either sec-

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1

Accompanied by Dr. David Mullen (EIP Associates), Mr. Jim Revoir (Berg-Revoir Corporation), and Mr. Malcolm Sproul (LSA).

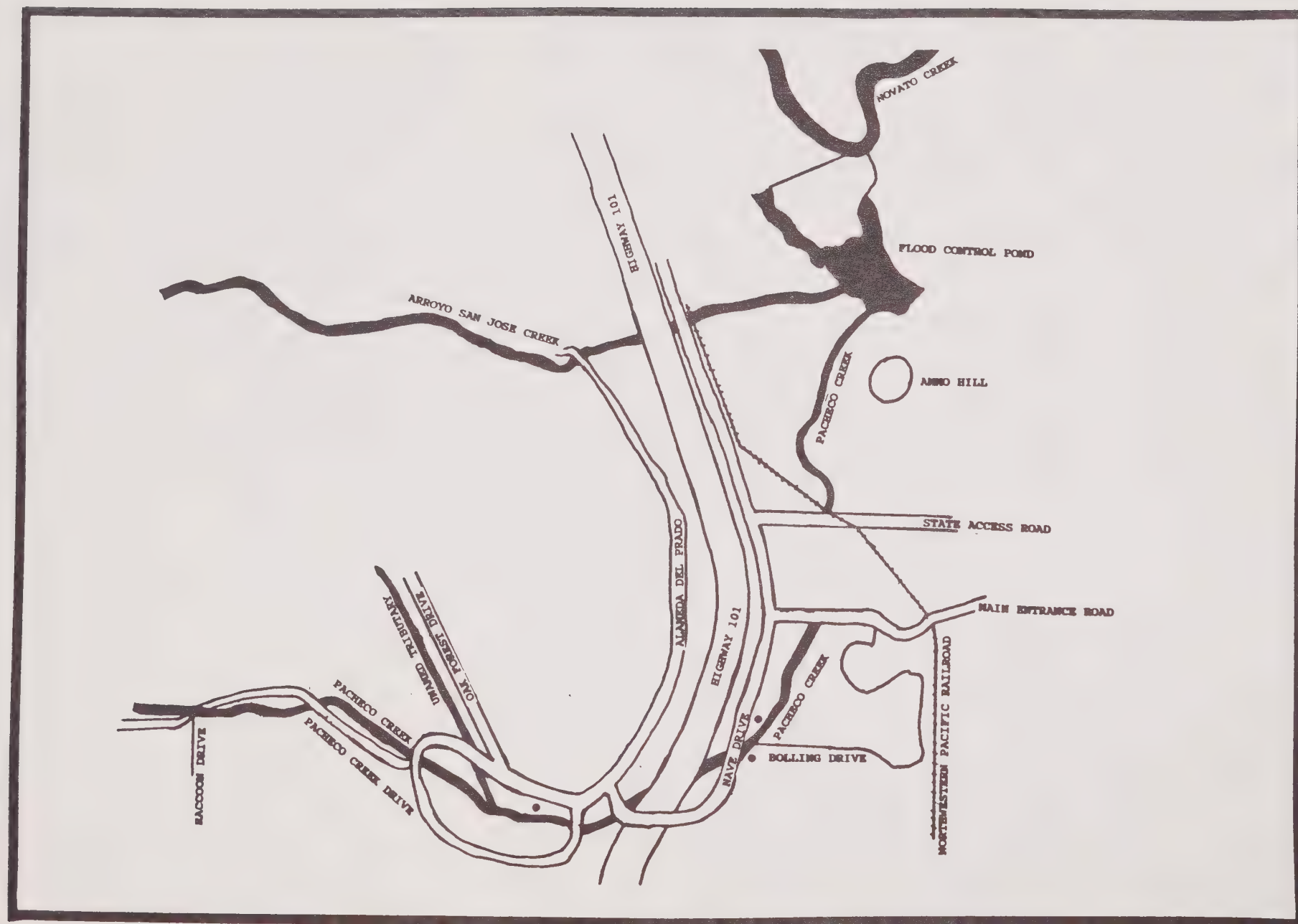


Figure 1. Pacheco Creek, Novato, Marin County, California. ( ● = Electrofishing Sites)

tion and to determine if there were pools west of the freeway which might be suitable for salmonid rearing. A small pool approximately 1/2 mile west of the freeway was electrofished.

The measurements recorded for each general habitat type on April 5 and 7 included: (1) a general description of the habitat; (2) presence/absence of redds; (3) maximum and mean channel widths and depths; (4) relative amount of cover (in-stream and overhanging); (5) substrate composition (suitable/unsuitable spawning gravel); (6) water temperature; (7) bank composition (erosion problems); and, (8) potential migration barriers for anadromous salmonids.

### III. RESULTS AND DISCUSSION

Pacheco Creek can be divided into six sections:

- (1) Flood Control Pond to State Access Road;
- (2) State Access Road to Main Entrance Road;
- (3) Main Entrance Road to Nave Drive;
- (4) Nave Drive under Highway 101 to west side of freeway;
- (5) West side of Highway 101 to Raccoon Drive;
- (6) Raccoon Drive to end of Pacheco Creek Drive;

A description of each of these sections is summarized in the following paragraphs.

#### Flood Control Pond to State Access Road

The stream section from the Flood Control Pond to the State Access Road is not suitable for either the spawning or rearing of salmonids. The first mile of Pacheco Creek was through a wetland/marshy area just west of "Ammo Hill" (Figure 1). The Creek can be described as a long channelized pool approximately 18 feet wide and 1-3 feet deep. The banks of the Creek within this section were inundated with cattails, blackberry bushes, and willows. Approximately one mile upstream, the channel changed to a cement channel which extend-

ed to State Access Road. Although the average width of the channel was 15 feet, only about 3 feet of the center of the channel had water in it (average depth 2 inches, less than 0.1 ft/second) and this section was inundated with cattails. At State Access Road, Pacheco Creek disappeared via five (4 feet diameter) culverts and reappeared again at Main Entrance Road.

#### State Access Road to Main Entrance Road

Pacheco Creek disappeared into culverts for a distance of approximately 1/2 mile from State Access Road to Main Entrance Road.

#### Main Entrance Road to Nave Drive

Although this section had some good spawning gravel (20-30%), the entire area was shaded with oak and alder trees, and water temperatures were not high (55 and 60 degrees F at 11:00 a.m and 4:45 p.m, respectively, on April 5), the high degree of embeddedness (60-80%) and low flow conditions (average flow estimated to be less than 0.1 ft/sec) limited the spawning and rearing potential of this section of creek. No redds were observed. In addition, as summer approaches, flows will be reduced and water temperatures will increase further. Only stickleback (Gasterosteus aculeatus) (1-3 inches total length) were collected during the electrofishing of this section.



This section of the Creek can be described as a low-flow series of riffle/glides and pools with steep banks (70-90 degree) covered with blackberry bushes and oak trees. The flow in the channel was 1-3 feet wide with an average depth of 1-3 inches in the riffle/glide areas; the pools were 1-3 feet deep. Filamentous algae were abundant on the bottom of the Creek throughout this section.

Two potential migration barriers occurred within this section. The first was a cement culvert at the downstream end of Bolling Drive. It consisted of two (4 feet diameter) cement sections which passed under Bolling Drive, followed by a 4 foot cement drop into a large pool (approximately 40 feet X 31 feet, 2-3 feet deep) on the downstream end of Bolling Drive. Although it is highly doubtful that salmonids use this Creek at all, this potential barrier might not be a problem during the high flow season; the pool would probably fill up with water to the level of the cement ledge. The second potential migration barrier -- a debris jam-- occurred about 20 feet downstream of the culvert under Nave Drive; this jam created a stagnant (3-5 feet deep) pool upstream of the jam.

#### Nave Drive Under Highway 101 to West Side of Freeway

Pacheco Creek disappeared under Nave Drive via a large (6 feet diameter) cement culvert, reappeared in the form of a cement channel (approximately 15 feet wide), disappeared under highway 101 and reappeared on the west side of the freeway.



#### West Side of Highway 101 to Raccoon Drive

If there were more water in the Creek, this section (approximately 1.5 miles) would afford the best salmonid spawning and rearing habitat of any section of the Creek. Abundant shade is provided by oak trees and the substrate is composed largely of gravel which would be suitable for spawning. However, no redds were observed and only stickleback (1-3 inches total length) were collected during the electrofishing. In addition, Pacheco Creek disappeared into the gravel approximately 600 feet upstream of the freeway and then reappeared again several hundred feet upstream.

This stretch of the Creek is characterized by steep (80-90 degrees, 20-30 feet high) denuded banks. Oak trees line the top of the banks throughout this section, thus shading the area. An unnamed tributary intersects the Creek between Cinnamon Teal and Timothy Court; this tributary runs adjacent to Oak Forrest Road (Figure 1). Although Pacheco Creek consisted of riffle/glide and pool sequences, it was only 1-2 inches deep in most of the area and what pools existed were stagnant-appearing. As this is a dry year, the low flow conditions may be atypical for this creek at this time of year.

#### Raccoon Drive to End of Pacheco Creek Drive

After passing (via a culvert) under Pacheco Creek Drive, Pacheco Creek is riprapped to the end of Pacheco Creek Drive.

#### IV. CONCLUSIONS

From the survey, the following conclusions can be made:

- (1) No salmonids (anadromous or non-anadromous) and no spawning redds were sighted;
- (2) If more water were flowing, there would be good spawning and rearing areas in Pacheco Creek west of Highway 101;
- (3) Due to the limited water supply, it is doubtful that salmonids use Pacheco Creek for spawning or rearing; and,
- (4) The weedy pools, sandy substrate, and relatively cool (55-60 degrees F) water provide excellent habitat conditions for the three-spine stickleback (Gasterosteas aculeatus), the only fish collected during the electrofishing.

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## HABITAT EVALUATION PROCEDURES (HEP) STUDY





HABITAT EVALUATION PROCEDURES (HEP) STUDY

HAMILTON FIELD PROJECT

PREPARED FOR  
BERG-REVOIR CORPORATION  
500 PALM DRIVE  
NOVATO, CA 94947

PREPARED BY  
LSA ASSOCIATES, INC.  
157 PARK PLACE  
POINT RICHMOND, CA 94801  
(415) 236-6810  
LSA #BRC240

June 7, 1988





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## INTRODUCTION

This report describes the rationale, approach, and results of a "desktop" HEP that evaluated impacts of the Berg-Revoir Corporation's Hamilton Field project on wildlife habitat and estimated the acreage of mitigation areas needed. Specifically, the HEP was designed to (1) estimate the project-related losses in habitat value of riparian woodland and herbaceous wetland habitats, and (2) estimate the acreage necessary to replace these habitat values on an in-kind basis, following the Wetlands Mitigation Plan included as part of the Revised Master Plan (September 1, 1987).

Figure 1 indicates the locations of existing wetlands, impacts on wetlands, and proposed mitigation sites. Additional background information is available in the Technical Appendix to the Master Plan and in the Environmental Impact Report. Much of the information in this report on existing biological resources of the project area was drawn from those documents and from the Mitigation Plan. Additional information was obtained during site visits in April and May, 1988.

HEP studies assign Habitat Suitability Index (HSI) ratings to the major cover types (vegetation types) to be affected by a project. An HSI of 1.0 means that a particular site has optimal wildlife habitat value compared with other patches of that cover type in the general vicinity; usually a relatively large patch of undisturbed natural habitat will have an HSI of 1.0.

Like other HEP studies, this HEP estimated HSI ratings before the project begins and at various points in the future (Target Years). From these data, along with the acreages of impact, the HEP estimated total impacts on habitat value. Similarly, HSI ratings were assigned to mitigation sites, before and after implementation of a mitigation plan. The HEP then calculated the total increase in habitat value, based on the acreage of mitigation lands offered in the Mitigation Plan.

As is customary for HEP studies, a HEP team was selected to make decisions about the approach, assumptions, and HSI values to be used. The HEP team consists of the following members:

- o Steve Granholm, LSA Associates, Inc. (LSA), representing Berg-Revoir Corporation
- o Cay Goude, Ecological Services, U. S. Fish and Wildlife Service (FWS)



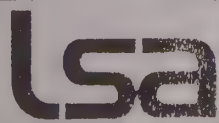


FIGURE 1.

Hamilton Field Project : Wetland Impacts and Mitigation





- o Carl Wilcox, Environmental Services, Region 3, California Department of Fish and Game (DFG)

Because this is a desktop, or simplified, HEP, it did not include wildlife-habitat models or a field meeting of the HEP team to assign HSI ratings. Instead, the ratings were assigned based on professional judgment of the HEP team members. In cases where the HEP team could not reach agreement on a particular HSI value, an average of the three team members' HSI ratings was used. This desktop HEP also simplified the normal HEP method by assigning only one HSI value for each patch of wildlife habitat, rather than separate HSI values for each of several wildlife species that use that habitat patch. The single HSI value took into account the overall value of a particular habitat patch to the wildlife that typically use that cover type.

As the first step in the HEP study, LSA prepared a study plan that included the proposed scope of the study, assumptions to be used, and proposed HSI ratings for the various patches of the two cover types. The HEP team then met to review the study plan and determine what changes might be required. The study described here reflects the approach agreed upon by the HEP team.

## SCOPE OF THE STUDY

### STUDY AREA

The study area is shown on the attached maps. It includes the wetlands and adjoining habitats in the Hamilton Field project area, located in the northwest portion of the property in the vicinity of Ammo Hill.

### COVER TYPES

This HEP study assessed impacts and mitigation for two cover types:

- o Riparian woodland
- o Herbaceous wetland

### TIME PERIOD AND TARGET YEARS

The study addressed a time period of 100 years, from Target Year 0, when project construction begins, until Target Year 100, 100 years later. For the purpose of this study, 1989 is designated as Target Year 0, as most project impacts and mitigation measures are expected to take place that year or shortly thereafter. Target years also include the years when restored habitats are expected to reach key points in their development. Herbaceous wetland is expected to reach full habitat value at Target Year 3. Riparian woodland is expected to reach the habitat value of the better existing stands on-site by Target Year 10 and to reach full habitat value by Target Year 35 (see below).



## IMPACTS AND MITIGATION

### IMPACT SITES: EXISTING CONDITIONS AND EXPECTED IMPACTS

#### Riparian Woodland

This cover type presently occurs along the banks of Pacheco Creek downstream from the end of the concrete channel and in the area lying between the west side of Ammo Hill and the creek channel. The Hamilton Field project will remove about 1.5 acres of riparian woodland in several patches southwest of Ammo Hill. Estimated habitat values of these patches are presented in Table 1 and Figure 2.

The riparian woodlands on site, including the impact areas, are young stands established in the early 1950's, with a canopy consisting primarily of yellow and arroyo willows. Understory vegetation is primarily composed of herbaceous species, with California rose and Himalaya berry occurring locally along the edge of the woodland. The riparian woodland impact areas have dense growths of these shrubs along their edges.

The habitat value of these riparian woodlands is considered moderate. The lack of human disturbance and the relatively dense canopy cover enhance habitat value for many riparian-associated songbirds and raptors and provide good cover for deer and carnivores that may feed in the woodland or use it as a movement corridor. The value of these woodlands is also enhanced by the diversity of adjoining habitats, including cattail marsh, seasonal wetland, oak woodland, and grassland. Several other factors, however, detract from the overall wildlife value of these riparian areas. The low diversity of riparian trees compared to nearby riparian woodlands along San Jose Creek, and especially the lack of oaks, will limit the number of bird species present. In addition, the lack of old trees or snags limits the availability of dead limbs for cavity-nesting birds and mammals.

The smaller clumps of riparian woodland (Sites 3, 4, 5, and 6) to be removed by the project have lower value to riparian wildlife than do the larger clumps (parts of Sites 7 and 9). This is because many species require larger stands of relatively dense canopy woodland to provide their needs for food, cover, and breeding. Site 9 appears to have a slightly lower wildlife value than Site 7, because the former has a more open canopy, is part of a smaller stand, and is set off from the streamside corridor.

The existing riparian woodlands are expected to improve gradually in habitat value as the trees grow larger, producing more dead wood for cavity-dwellers, and as other riparian tree species gradually colonize the stands.

TABLE 1

RIPARIAN WOODLAND: HABITAT VALUES (HSI)<sup>a</sup> AT IMPACT SITES  
AND MITIGATION SITE, WITH AND WITHOUT THE PROJECT

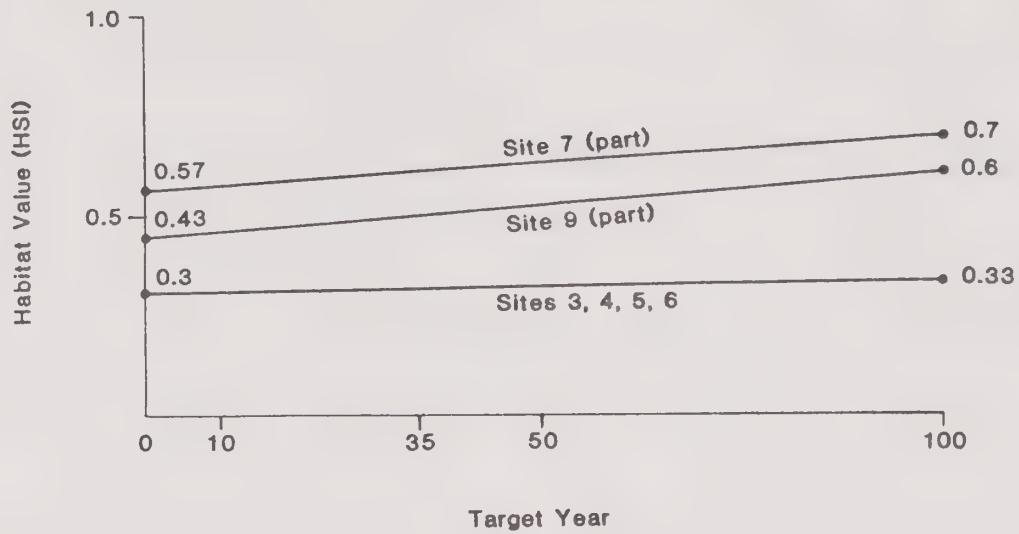
Site	Existing Conditions TY = 0 <sup>b</sup>	Without Project TY = 100	With Project and Mitigation		
			TY = 10	35	100
1. <u>Impact Sites</u> <sup>C</sup>					
a. Southern part of Site 7 (1.0 acre)	0.57	0.7	0	0	0
b. Southeast part of Site 9 (0.3 acre)	0.43	0.6	0	0	0
c. All of Sites 3, 4, 5, and 6 (0.2 acre)	0.3	0.33	0	0	0
2. <u>Mitigation Site</u>					
a. West of Site 7 (1.6 acre)	0	0.1	0.57	0.8	0.8

<sup>a</sup> HSI = Habitat Suitability Index. An HSI of 1.0 indicates optimal habitat value.

<sup>b</sup> TY = Target Year.

<sup>c</sup> To simplify calculations, it is assumed that all impacts occur at TY = 0, i.e. at the very beginning of the project.

### Impact Sites, Without Project



### Mitigation Site, With and Without Project

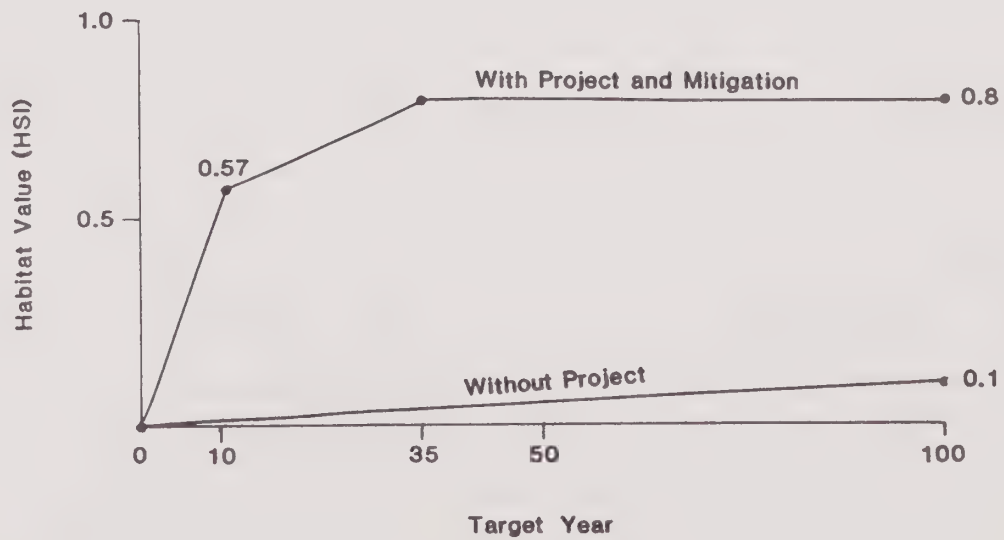


FIGURE 2

Riparian Woodland: Habitat Values (HSI)  
at Impact Sites and Mitigation Site

## Herbaceous Wetland

This cover type is located in numerous patches around Ammo Hill and the main Ammunition Storage Bunker. Two types of herbaceous wetlands will be removed by the project: about 3.1 acres of cattail marsh in various channels and ditches (Sites 18, 19, 20, 21, 22, and 23) and about 2.6 acres of grass/forb seasonal wetlands in shallow depressions south of Ammo Hill (Sites 11, 24, 25, and 26). Both types are surrounded primarily by grassland vegetation. Estimated habitat values of these sites are presented in Table 2 and Figure 3.

The cattail marshes to be removed occur in long, linear patches where standing water or saturated soils occur throughout most or all of the year. Habitat value is considered low, due to the small size of these marshes, the minimal amount of open water, and the lack of bordering riparian woodland.

The seasonal wetlands to be removed occur in areas where standing water or saturated soils occur for short periods in the winter. These areas support a variety of hydrophytic forbs and grasses. Habitat value for wetland-adapted wildlife is considered low, due to the short period when ponded water is present each year and the small size of the wetland patches. Habitat value of Sites 24, 25, and 26 is particularly low because little if any water forms persistent ponds there, except perhaps in years of especially high precipitation.

An additional patch of herbaceous wetland is located in the concrete-lined portion of Pacheco Creek that extends from the Northwestern Pacific Railroad downstream to the south end of Site 7 (riparian woodland). Present plans call for relocating this portion of the creek into an underground culvert. Sediments and plant growth that occur in this channel are removed every few years to maximize the channel's capacity to carry stormflows. The channel is presently occupied by dense cattails with a few scattered small willows up to 10 feet tall. The portion of the concrete-lined channel that has not been cleaned out recently and supports a temporary growth of cattails is about 1650 feet long and 9 to 14 feet wide, with a total area of about 0.4 acre.

The Army Corps of Engineers did not assert jurisdiction over this channelized portion of Pacheco Creek, but FWS and DFG requested that it be included in the HEP analysis. It is their position that the channel provides some habitat value even immediately after vegetation removal and higher values as cattails colonize the deposited sediments. In this analysis, we assumed that the habitat periodically reaches a maximum value equivalent to that of

**TABLE 2**

**HERBACEOUS WETLAND: HABITAT VALUES (HSI)<sup>a</sup> AT IMPACT SITES  
AND MITIGATION SITES, WITH AND WITHOUT THE PROJECT**

<u>Site</u>	<u>Existing Conditions TY = 0<sup>b</sup></u>	<u>Without Project TY = 100</u>	<u>With Project and Mitigation</u>	
			<u>TY = 3</u>	<u>TY = 100</u>
<b>1. <u>Impact Sites<sup>c</sup></u></b>				
a. Cattail marsh: Sites 18, 19, 20, 21, 22, and 23 (3.1 acres)	0.3	0.3	0	0
b. Concrete portion of Pacheco Creek with temporary cattail growth (0.4 acre)	0.2 <sup>d</sup>	0.2 <sup>d</sup>	0	0
c. Seasonal wetland: Site 11 (1.1 acre)	0.3	0.3	0	0
d. Seasonal wetland: Sites 24, 25, and 26 (1.5 acre)	0.2	0.2	0	0
<b>2. <u>Mitigation Sites</u></b>				
a. Seasonal wetland: east of Ammo Hill (3.3 acre)	0	0	0.6	0.6
b. Seasonal wetland: west of Ammo Hill (2.5 acre)	0	0	0.5	0.5
c. Seasonal wetland: by riparian mitigation site (0.2 acre)	0	0	0.2	0.2

<sup>a</sup> HSI = Habitat Suitability Index. An HSI of 1.0 indicates optimal habitat value.

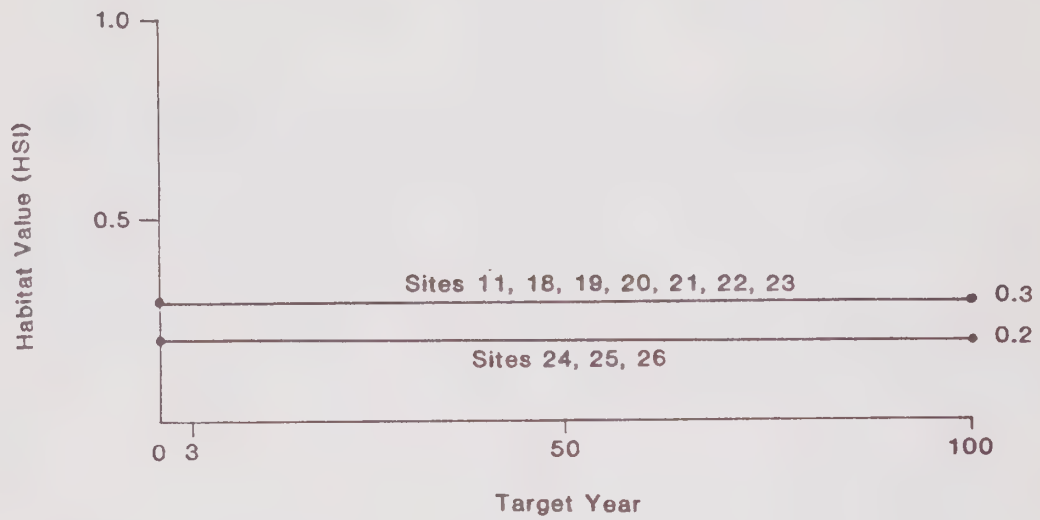
<sup>b</sup> TY = Target Year.

<sup>c</sup> To simplify calculations, it is assumed that all impacts occur at TY = 0, i.e. at the very beginning of the project.

<sup>d</sup> Average habitat value over the 100-year period.



### Impact Sites, Without Project



### Mitigation Sites, With Project and Mitigation

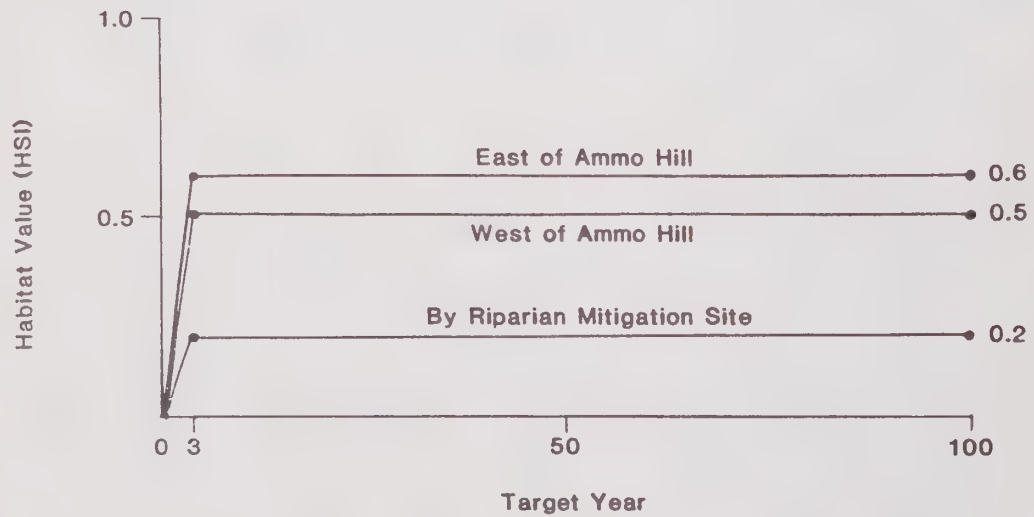


FIGURE 3

Herbaceous Wetland: Habitat Values (HSI)  
at Impact Sites and Mitigation Sites



the cattail marshes in the project area (HSI = 0.3) and retains a minimal habitat value (HSI = 0.1) after clearing. Based on these values, we assumed that the average value over the 100-year study period will be 0.2.

#### MITIGATION SITES: EXISTING CONDITIONS, MITIGATION PLANS, AND FUTURE VALUES

##### Proposed Mitigation for Riparian Woodland

The Mitigation Plan proposes planting about 1.6 acres of new riparian woodland in the western part of the project site, along the new Pacheco Creek channel and along the existing channel. The result will be a net increase of about 0.1 acre of riparian woodland. The mitigation site is adjacent to a large stand of existing riparian woodland (Site 7) and is presently occupied by grassland vegetation. Thus the site presently has no appreciable habitat value for wildlife of riparian woodlands. Estimated future values of the site, with and without the project, are presented in Table 1 and Figure 1.

The site will be planted with a variety of riparian trees, including the two willows presently occurring along Pacheco Creek, as well as Oregon ash, white alder, bigleaf maple, valley oak, coast live oak, and California buckeye. The understory will be planted with several native riparian shrubs. These species are all native to the locality (e.g., San Jose Creek) and appropriate for the local site conditions. Further details on the plantings are provided in the Mitigation Plan.

There will be a buffer area of retained grassland vegetation between the riparian mitigation area and the new entrance road to the east. The road itself will also serve to buffer this area from the new development east of the road. The mitigation area will also be buffered by the railroad right-of-way and the existing riparian vegetation. Thus, although human disturbance will be somewhat greater than at present, it is not expected to cause a major reduction in habitat value.

In this project area, we assume that the riparian plantings will be designed and maintained for rapid growth, so that the planted willows and shrubs will take about 10 years to reach the same approximate size and canopy coverage as those now existing on the site. Thus the planted riparian woodland will take about 10 years to attain the same habitat value as the better stands now existing on the site. We also assume that the planted valley oaks, willows, and other riparian trees will reach full habitat value in 35 years, with broad canopies, full seed production, substantial amounts of dead wood (for cavity-nesters), and many trees exceeding 50 feet in height and 12 inches in diameter (at breast height). At that time, habitat value of the mitigation site is expected to be considerably higher than that of the

existing riparian woodland. The higher value will be due to the greater diversity of the tree canopy, greater amounts of dead wood for cavity-nesters, and more extensive shrubby understory. (Note that without the project, the existing woodlands would gradually improve in these respects, but not nearly as fast as the planted mitigation areas.)

### Proposed Mitigation for Herbaceous Wetland

The Mitigation Plan proposes to create about 6.0 acres of new seasonal wetland, approximately equivalent to the 5.7 acres of existing herbaceous wetland under Corps jurisdiction and the additional 0.4 acres in the concrete channel. The two main mitigation sites for this habitat are located east and west of Ammo Hill (3.3 and 2.5 acres, respectively). Both will serve to enlarge existing wetlands and connect them to nearby wetland areas. In addition, two small patches of seasonal wetland (totalling 0.2 acre) will be created adjacent to the riparian mitigation area. The net effect of the project will thus be to consolidate wetlands in the project area into larger contiguous systems, while removing several small, relatively isolated patches of wetland. Estimated future values of these sites, after implementing the mitigation plan, are presented in Table 2 and Figure 2.

The seasonal wetlands will be created by grading grassland areas down to the elevation of existing wetlands in their immediate vicinity. The resulting low-lying areas will then pond water seasonally. To ensure that ponding occurs each year, these new wetlands will be flooded on or about November 15 each year to a depth of 4 to 6 inches. All graded surfaces of the new wetlands will be revegetated with a mix of plant species found in the existing seasonal wetlands.

To minimize human disturbance, the Mitigation Plan makes use of existing buffers, including the runway area, existing wetlands, and project open space. The plan also provides for grassland buffer strips, fencing, building setbacks, and plantings of California rose and Himalaya berry to discourage human intrusion where there is adjacent development. These barriers should reduce human disturbance significantly, but it will still be a factor for disturbance-prone wildlife such as waterfowl and herons in the portions of the wetlands adjacent to heavily used walkways.

## ASSUMPTIONS USED FOR HEP CALCULATIONS

### IN GENERAL

1. Habitat values (HSI) were estimated based on the value of each site to local wildlife of riparian woodland and herbaceous wetland, respectively.
2. The two types of herbaceous wetland (seasonal wetland and cattail marsh) were treated as if their habitat values are equivalent, i.e., a cattail marsh with HSI = 1.0 has the same value as a seasonal wetland with HSI = 1.0. In rating the habitat values of individual sites, however, these two types were rated separately. In other words, cattail marsh was compared to the best quality cattail marsh in the region, while seasonal wetland was compared to other seasonal wetlands.
3. Existing habitat values (HSI), and future values with and without the project, are as indicated in Tables 1 and 2. Each of these values represents the average of the HSI values estimated by the three members of the HEP team.
4. Existing habitat value at the mitigation sites is 0.
5. For purposes of the HEP analysis, project life is 100 years.

### NO-PROJECT ALTERNATIVE

1. If the project is not implemented, there will be no significant changes in habitat value of the herbaceous wetlands that would be displaced by the project.
2. Habitat value of the riparian woodland will continue to improve gradually throughout the life of the project, due to maturation of the existing vegetation and colonization by other riparian trees and shrubs.
3. Habitat value at the proposed mitigation sites will remain at 0 for herbaceous wetlands, but will increase slightly for riparian woodland, due to gradual colonization by riparian trees along the edge of the site.



### WITH-PROJECT ALTERNATIVE

1. Impacts on riparian woodland and herbaceous wetland habitats will be as described above, and will be permanent. These impacts will occur at Target Year (TY) = 0, i.e. at the beginning of the project.
2. Riparian woodland and herbaceous wetland removed by the project will be replaced as described above and in the Wetland Mitigation Plan. Implementation will begin when project construction begins (TY = 0).
3. The created seasonal wetlands will reach full habitat value in 3 years, in a straight-line projection.
4. The planted riparian woodland will reach the same value as the better existing stands in 10 years. It will attain full habitat value in 35 years (both are straight-line projections).
5. Although grassland habitat would be displaced by the mitigation plan, this impact is not considered significant and thus is not included in the HEP analysis.

### OTHER ACTIVITIES ADDRESSED BY THIS ANALYSIS

The Army Corps of Engineers is conducting a cleanup of hazardous materials located on the project site, as part of its responsibility in connection with sale of the site to the project sponsor. This cleanup will require excavation of several patches of existing herbaceous wetland (Sites 19, 20, 21, 22, 23, and 24), a total of 4.1 acres. Thus, removal of these existing wetlands will not be the responsibility of Berg-Revoir Corporation.

The Wetlands Mitigation Plan described in this report and in the Revised Master Plan for the Hamilton Field project is designed to mitigate both the Berg-Revoir project and the Corps cleanup activities. This HEP took into account the Corps activities by making separate calculations of the habitat values to be lost due to the Corps activities and those due to the Berg-Revoir project. This made it possible to calculate the acreage of mitigation that is the responsibility of each party.

## RESULTS AND DISCUSSION

The results of the HEP study are summarized in Tables 3 and 4. Impacts on habitat value were expressed in Average Annual Habitat Units (AAHU's). In HEP terminology, one Habitat Unit (HU) of a particular cover type is equivalent to a one-acre site with optimal habitat value (HSI = 1.0). Thus the existing value of a particular site in HU's is simply the acreage of the site multiplied by its HSI. This HEP study calculated the average value of each habitat patch over the entire study period (expressed in AAHU's) for two scenarios: with the project and without the project (see Figures 1 and 2). The difference represents the impact of the project on habitat value. In this case, the results indicate projected losses of:

- o About 0.9 AAHU's of riparian woodland, all attributable to the Berg-Revoir project
- o About 1.6 AAHU's of herbaceous wetland, of which Berg-Revoir is responsible for 0.5 AAHU's and the Corps of Engineers is responsible for 1.1 AAHU's

The mitigation analysis first determined the average habitat value expected at each mitigation site through the 100-year study period, based on the graphs in Figures 1 and 2. The mitigation credit (in AAHU's) is the difference between the habitat value with the project (including mitigation) and the habitat value without the project. The results indicate the following mitigation credits:

- o About 1.1 AAHU's for the riparian woodland mitigation, representing a net gain of 0.2 AAHU's (compared to the impacts)
- o About 3.2 AAHU's for the herbaceous wetland mitigation, representing a net gain of 1.6 AAHU's.

**TABLE 3**  
**RIPARIAN WOODLAND; RESULTS OF HEP STUDY**  
**HAMILTON FIELD PROJECT**

<u>Impact Sites</u>	<u>Acreage</u>	<u>Average Habitat Value (HSI)<sup>a</sup> Without Project</u>	<u>Average Annual Habitat Units To Be Lost<sup>b</sup></u>
a. Southern part of Site 7	1.0	0.64	0.64
b. Southeast part of Site 9	0.3	0.52	0.16
c. All of Sites 3, 4, 5 and 6	0.2	0.32	0.06
	<hr/>	<hr/>	<hr/>
TOTAL	1.5	N/A	0.86

<u>Mitigation Site</u>	<u>Acreage</u>	<u>Average Habitat Value (HSI)<sup>a</sup></u>		<u>Average Annual Habitat Units To be Gained</u>
		<u>Without Project</u>	<u>With Project</u>	
a. West of Site 7	1.6	0.05	0.72	1.07

<sup>a</sup> Over the 100-year study period (see Figure 1).

<sup>b</sup> Assumes all habitat values are lost at Target Year 0.



**TABLE 4**  
**HERBACEOUS WETLAND: RESULTS OF HEP STUDY**  
**HAMILTON FIELD PROJECT**

Impact Sites	Acreage (Responsible Party) <sup>a</sup>	Average Habitat Value (HSI) <sup>b</sup> Without Project	Average Annual Habitat Units To Be Lost <sup>c</sup> (Responsible Party) <sup>a</sup>
a. Cattail marsh: Site 18	0.1 (BRC)	0.3	0.03 (BRC)
Sites 19, 20, 21, 22, and 23	3.0 (Corps)	0.3	0.90 (Corps)
b. Concrete portion of Pacheco Creek with temporary cattail growth	0.4 (BRC)	0.2	0.08 (BRC)
c. Seasonal wetland: Site 11	1.1 (BRC)	0.3	0.33 (BRC)
d. Seasonal wetland: Site 24	1.1 (Corps)	0.2	0.22 (Corps)
Sites 25, 26	0.4 (BRC)	0.2	0.08 (BRC)
Corps Total	4.1	N/A	1.12
Berg-Revoir Total	2.0	N/A	0.52
GRAND TOTAL	6.1	N/A	1.64

Mitigation Sites	Acreage	Average Habitat Value (HSI) <sup>b</sup> With Project	Average Annual Habitat Units To Be Gained <sup>d</sup>
a. Seasonal wetland: east of Ammo Hill	3.3	0.59	1.95
b. Seasonal wetland: west of Ammo Hill	2.5	0.49	1.23
c. Seasonal wetland: by riparian mitigation site	0.2	0.20	0.04
TOTAL	6.0	N/A	3.22

<sup>a</sup> BRC = Berg-Revoir Corporation; Corps = Army Corps of Engineers.

<sup>b</sup> Over the 100-year study period.

<sup>c</sup> Assumes all habitat values are lost at Target Year 0.

<sup>d</sup> Assumes habitat value without the project is 0 throughout the 100-year period.



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## TREE PRESERVATION METHODOLOGY



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## TREE PRESERVATION METHODOLOGY

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Trees in construction zones are often adversely affected by construction activities and by altered environmental influences following project completion, if precautionary measures are not taken. The following measures are directed toward oak trees, but this preservation methodology would also apply to other trees in the project area.

Leave the area around the tree in a natural state. The area within the dripline (the total circumference of the trees including foliage) should ideally be undisturbed, with little or not grading, watering, or planting.

If grading must occur, it should be at least 6 feet beyond the dripline.

No equipment should be operated within 6 feet of a dripline.

Fill materials tend to compact and make the soil impermeable, thereby restricting or prohibiting exchange of gases and movement of water. Excessive moisture that is trapped by fill can lead to root rot. In fill areas with trees, the following precautions should be employed:

- (a) Remove grass, leaves and other material that may form an impervious layer before fill material is added.
- (b) Provide tile drainage resting on the soil and radiating from the trunk beneath tree branches with sufficient slope to drain water away from the root crown.
- (c) Build a retaining wall at least 6 feet from the base of the tree and several inches higher than the surrounding fill. Any material can be used for the retaining wall (wood, concrete, wire mesh, rock).
- (d) Use only porous topsoil.

Drainage is very important to oaks, madrones and bays since these trees are sensitive to changes in the balance of moisture, air and nutrients in the soil. Concrete foundations, footings and streets constructed downhill from the trees can act as a dam by trapping water. If such obstructions occur, french drains or gravel and porous tile should be provided to lead water away from the root crown.

No trenching should be permitted beneath trees. If trenching in the root zone of trees is absolutely necessary, one trench should be used by all utilities.

Temporary fencing around the trees in construction zones should be provided to prevent slippage of rocks or soil from excavation sites to tree root zones, and earth compaction around trees in the offsite areas. Fencing should be installed just prior to movement of construction equipment to the job site and should be removed after completion of construction on that site.

No pavement should be placed within a 6-foot radius from the base of the tree.

Only dead, weakened, or top-heavy branches should be removed from oaks. When roots are excessively damaged or removed, compensatory pruning should follow. Avoid excessive pruning or thinning of limbs since this action stimulates the production of succulent new growth that is subject to powdery mildew and may cause a decline in vigor or kill the tree. Essential pruning should be done during the dormant period (winter) in deciduous tree species and during July and August in evergreen species.

Pest Control Suppression of any pests (disease, insect or nematode) should be carried out under the supervision of a certified pest control operator only after proper diagnosis is provided by a registered pest control advisor.

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Source: City of Novato, EIR on the General Plan, 1981.



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## AIR QUALITY ASSUMPTIONS AND EMISSION FACTORS



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## CALINE3 INPUT DATA AND ASSUMPTIONS

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### Meteorology

Wind Speed	1 meter per second
Wind Angle	every 22.5 degrees around the compass
Stability	Pasquill-Turner class F
Mixing Height	100 meters
Averaging Time	1 hour
Surface Roughness	108 centimeters
Ambient CO concentration	1-hour: 1988 - 8.0 ppm; 1997 - 7.3 ppm 8-hour: 1988 - 4.0 ppm; 1997 - 3.7 ppm

### Traffic

Traffic volumes and other data supplied by Wilbur Smith Associates.

### Emission Factors

Emission factors were taken from the BAAQMD publication, Air Quality and Urban Development. These emission factors are generated by the BAAQMD's EMFAC7D computer program. Emission factors are speed-dependent. Traffic flow speeds were chosen based on roadway Level of Service information supplied by Wilbur Smith Associates.

# GENERALIZED EMISSION FACTORS FOR SELECTED INDUSTRY GROUPS

Industry Group	Average Emissions (Lbs./Acre/Day)				
	CO	ORG	NOx	SO <sub>2</sub>	PART
<u>Manufacturing</u>					
Food Canning	2.20	0.50	19.00	22.00	0.30
Paper Products	0.60	4.40	2.80	0.01	0.20
Printing and Publishing	6.00	31.00	42.00	0.20	3.50
Inorganic Chemicals	5.90	0.60	4.90	2.60	1.60
Paints and Varnishes	0.10	20.00	0.50	0.00	0.20
Organic Chemicals	1.60	8.50	3.00	0.50	1.40
Petroleum Refining	1.30	18.00	26.00	16.00	1.40
Paving and Roofing	5.30	1.90	11.00	0.70	17.00
Plastic Products	0.10	51.00	0.60	0.00	1.10
Stone, Clay, Glass and Concrete	3.00	2.40	17.00	4.60	14.00
Iron and Steel Foundries	23.00	44.00	5.00	2.80	11.00
Metal Containers	0.80	90.00	5.50	0.03	0.50
Heating Equipment	0.03	2.70	0.20	0.00	0.10
Metal Work	0.20	11.00	1.30	0.01	5.30
Metal Coating	0.10	13.00	0.80	0.00	0.30
Machinery, except Electrical	0.10	23.00	0.50	0.02	72.00
Semiconductors, etc.	0.10	32.00	0.30	0.01	0.10
Electronic Components	0.02	5.60	0.10	0.00	0.10
Instruments	0.02	23.00	1.40	0.01	0.30
<u>Other</u>					
Electric Utility	32.00	12.00	410.00	78.00	17.00
Petroleum Bulk Stations	0.01	150.00	0.10	0.02	0.01
Dry Cleaning Plants	0.01	6.60	0.10	0.00	0.00
General Hospitals	6.00	2.30	30.00	0.20	2.90
National Security	5.50	2.50	22.00	0.01	2.80

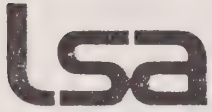
SOURCE: Bay Area Air Quality Management District.

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HAMILTON FIELD ALTERNATIVES ANALYSIS  
UNDER SECTION 404 (b) (1) OF THE CLEAN  
WATER ACT OF 1977, AS AMENDED







HAMILTON FIELD

ALTERNATIVES ANALYSIS UNDER  
SECTION 404(b)(1) OF THE  
CLEAN WATER ACT OF 1977, AS AMENDED

JUNE 1988

PREPARED BY

LSA ASSOCIATES, INC.  
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(415) 236-6810

LSA #BRC240



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### EXECUTIVE SUMMARY

The proposed project is a mixed-use development consisting of residential, commercial, light industrial, medical and open space uses on 452.1 acres of the former Hamilton Air Force Base in the City of Novato, Marin County, California. Approximately 23.6 acres of the site was determined to be wetlands of the United States and is subject to the jurisdiction of the U.S. Army Corps of Engineers. In order to accommodate the master planned development in accordance with the project's Basic Purpose, approximately 7.2 acres of the project site defined as wetlands would be eliminated as a result of discharge of fill materials.

The Basic Purpose of the proposed activity is to develop the site with a compatible mix of uses, emphasizing public transit and jobs/housing balance as a solution to current and prospective regional needs. The development plan for the site proposes 3,550 residential units, 2,900,000 square feet of business-related uses, and 71 acres to remain as open space in public ownership. A General Plan amendment and Master Plan approval from the City of Novato would be required for the project. It is anticipated that these entitlements will be granted to the applicant by July 1988.

Pursuant to 40 CFR 230 and 33 CFR 320-330, a detailed alternatives analysis was conducted in support of a pending application for a permit to discharge as required by Section 404 of the Clean Water Act of 1977, as amended. After delineation of the market area as lands readily accessible to Highway 101 and the Northwest Pacific Railroad line and after excluding parts of the market area from further consideration because of certain unalterable constraints that have been identified, the remainder of the area was examined and nine alternative potential sites were found. Ten specific site evaluation criteria were derived from the project's Basic Purpose, related considerations

of cost, logistics and technology, and accepted principles of community planning. Examples of the criteria employed include land availability, development costs, environmental hazards, and presence of wetlands. The criteria were applied to each site and no site was found to be a practicable alternative to the proposed site.

With no off-site alternatives emerging as suitable, the analysis proceeded to examine alternative configurations of the project activity on the project site. Three on-site alternatives were identified: use of adjacent lands, a no-fill alternative, and a partial-fill alternative. Each alternative was evaluated, again with reference to the project's Basic Purpose and related considerations, especially environmental impact and economic practicability. After evaluation, the proposed project design appeared to be the most practicable, least environmentally damaging design, when compared with the range of on-site alternatives studied.

## I. INTRODUCTION

### A. BACKGROUND

The proposed project, hereinafter referred to as Hamilton Field, is planned as a mixed-use development that will include residential, commercial, light industrial, research and development, medical, transportation, and open space uses. The project site is 452.1 acres in size and is a portion of the 1,600-acre former Hamilton Air Force Base in Novato, California. As shown in Figure 1, the base is located on the western shore of San Pablo Bay and east of U.S. Highway 101 between the Alameda del Prado and Ignacio highway interchanges. Section II of this analysis locates and describes the project in greater detail.

The project Applicant filed a comprehensive Master Plan application with the City of Novato in December, 1985. Based on the results of the environmental review process conducted by the City, the Applicant developed a revised plan dated September 1987, which constitutes the current proposal for the site. Implementation of the plan requires, by a discharge of fill materials, the elimination of 7.19 acres of the project site defined as wetlands, in order to accommodate the master planned development in accordance with its Basic Purpose. These 7.19 acres are within the 23.62 acres of the site determined to be wetlands of the United States and subject to Federal jurisdiction as noted in Appendix A to this report.

The Applicant's plan has undergone revisions and refinements in the course of its development that have reduced the fill requirement from a greater acreage than finally proposed herein. To the Applicant, the 7.19 acres in question represent the minimum fill under which the proposed activity is practicable.

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B. RELATIONSHIP TO THE CLEAN WATER ACT

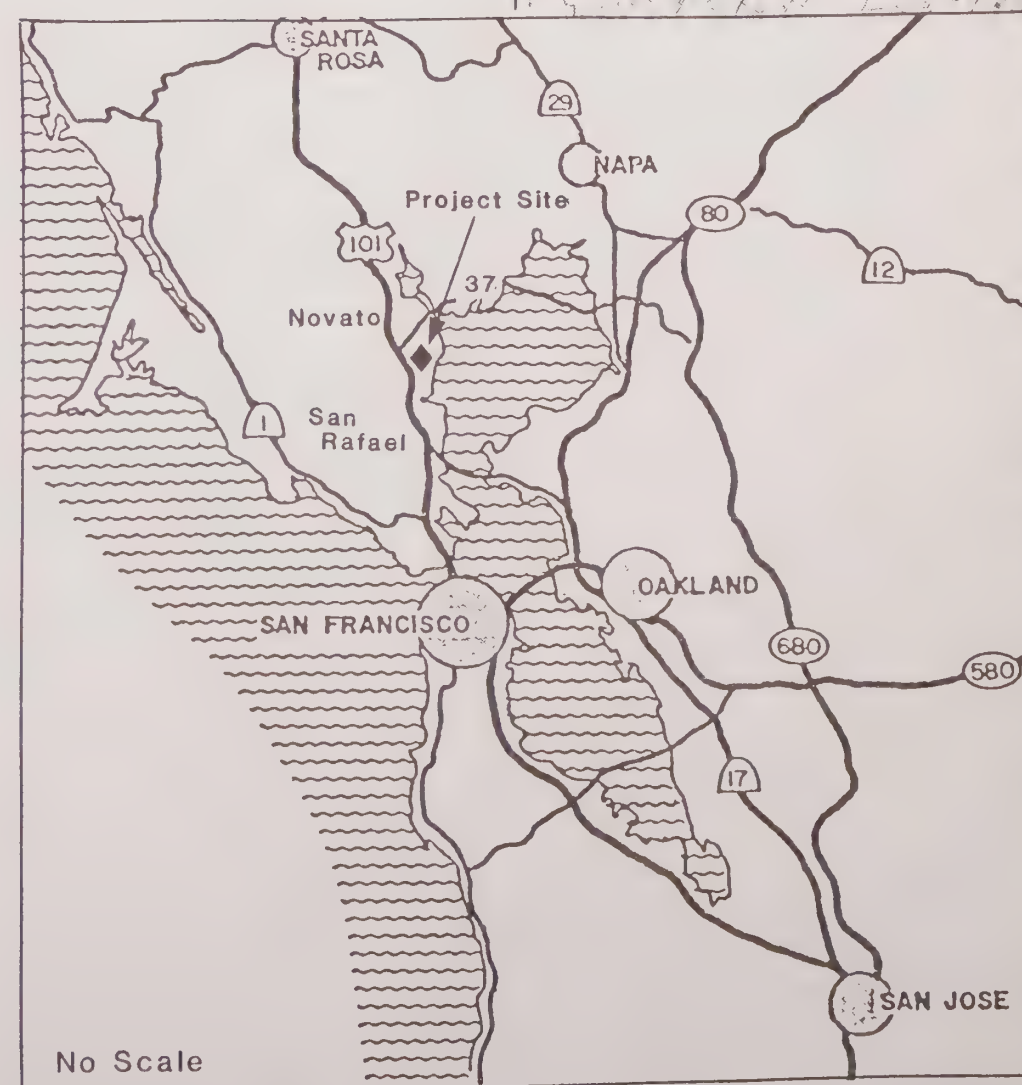
The Clean Water Act of 1977 prohibits the discharge of dredged or fill material into the waters and wetlands of the United States unless a discharge permit is obtained from the U.S. Army Corps of Engineers in accordance with Section 404 of the Act. Guidelines established by the U.S. Environmental Protection Agency (40 CFR 230, 24 Dec 80) specify the procedures for issuing discharge permits. The EPA Guidelines prohibit the discharge of fill materials into wetland areas under the following conditions:

- o If there is a practicable, less damaging alternative.
- o If discharges violate water quality or toxic effluent standards or jeopardize the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended.
- o If discharges will have significantly adverse effects on aquatic resources.
- o If appropriate and practicable steps have not been taken which will minimize the potential adverse impacts of the discharge on the aquatic ecosystem.
- o Under the Corps of Engineers' Permit Regulations for enforcement of Section 404 (33 CFR 320-330, 13 Nov. 86), an application for a discharge permit will be evaluated based on the following general criteria:
  - 1. The relative extent of the public and private need for the proposed structure or work;

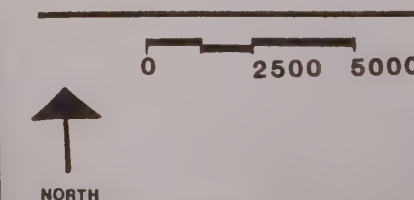


# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947



## LOCATION OF PROPOSED ACTIVITY







2. Where there are unresolved conflicts as to resource use, the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work; and
3. The extent and permanence of the beneficial and/or detrimental effects which the proposed structure or work is likely to have on the public and private uses to which the area is suited.

C. SCOPE OF ALTERNATIVES ANALYSIS

Prior to issuance of a discharge permit for a wetland site, the EPA Guidelines require that a detailed analysis of alternative site locations and alternative site design plans be conducted. The burden of proof is placed on the Applicant to demonstrate either:

- o That the project requires access or proximity to or siting within the special aquatic site to fulfill its basic purpose (i.e., the project is water dependent)

or

- o That there are no practicable alternatives to the proposed project site within the market area which would have less environmental impacts and that internal redesign of the proposed project will not eliminate the need for discharge of fill without jeopardizing the basic purpose of the project.

Under the guidelines, practicable alternatives which do not involve

discharge into a wetland site are presumed to exist and to have less adverse environmental impacts unless clearly demonstrated otherwise. The following analysis describes the Hamilton Field project, establishes its basic purpose, defines the market area, and evaluates potential alternative sites for development. On-site alternatives which involve varying amounts of discharge into wetland areas are also evaluated.

This analysis of alternative site locations and alternative site designs has been prepared under Section 404 (b) (1) of the Clean Water Act in accordance with the U.S. Army Corps of Engineers Permit Regulations and the U.S. Environmental Protection Agency Guidelines for Specification of Disposal sites for Dredged or Fill Material.

#### D. PROJECT APPLICANT

This analysis supports an application for a Section 404 permit from the U.S. Army Corps of Engineers. The application has been filed by the following party, herein referred to as the Applicant:

Berg-Revoir Corporation  
500 Palm Drive  
Novato, CA 94949

The date of application was October 7, 1985. The representative for the Applicant is Mr. James Revoir, who may be reached at the offices of the Applicant.

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## II. PROJECT DESCRIPTION

### A. COMPONENTS OF THE PROJECT

#### LOCATION AND SIZE

The Hamilton Field project site is 452.1 acres of the former 1,600-acre Hamilton Air Force Base in the City of Novato, the largest city in Marin County, California. The site is bounded on the east by the Hamilton Field runways on the shore of San Pablo Bay. These runways are not a part of the project site. They will remain indefinitely under the control of the U.S. Government and used exclusively for military purposes. On the western edge of the project site is U.S. Highway 101 (Figure 1). The project site is a portion of Marin County Assessor's Parcel Number 157-180-24.

#### PROJECT HISTORY

In March of 1985, 402 acres of the Hamilton Air Force Base, declared surplus land by the Federal Government, were offered at auction by the General Services Administration (GSA). The bid by the Berg-Revoir Corporation, the Applicant, was accepted by GSA. An additional 50.1 acres of upland area on the base is included in the project site for planning purposes, although transfer of these acres has not been completed.

In December of 1985, the Applicant filed a comprehensive Master Plan proposal with the City of Novato. The application resulted in the preparation of the Hamilton Field Master Plan Draft Environmental Impact Report completed in December 1986. After review of the report and consideration of comments from agencies, organizations and the public, the Applicant revised portions of the original project proposal. Changes to the original project included an

improved wetlands mitigation plan that insures that no net loss of wetlands acreage or habitat value will occur. The history and main elements of the mitigation plan are found in Appendix B to this report.

### EXISTING SITE CONDITIONS AND USES

Approximately 393 acres, or 87 percent of the project site is on flat terrain with slopes of 0 to 15 percent. The remaining 59 acres possess steeper slopes, some of which exceed 30 percent. Four hills located on the project site are dominant features of the landscape. They are known as Ammo Hill, Reservoir Hill, WAF Hill, and Hospital Hill and are shown in Figure 2. They range in elevation from 45 feet (Hospital Hill) to 162 feet (Ammo Hill). Almost the entire site was previously developed for military and some agricultural uses. The majority of existing structures are old and in blighted condition. Buildings and facilities on the base are currently used by the U.S. Army and U.S. Coast Guard as living quarters, aviation operations, and support facilities.

Regional access is provided by Highway 101, which is the only continuous north-south limited access road in Marin County. Nave Drive is a frontage road on the east side of the Highway between the Alameda Del Prado and the Ignacio interchanges. Current access to Hamilton Air Force Base is provided off Nave Drive by Main Gate Road and State Access Road. There is an existing internal system of private roads designed to serve the various parts of the base including most of the project site. Currently, there is no convenient vehicular connection from the central portions of the project site to any points outside the base. This is why a proposed new road to Nave Drive which will serve as the new main entrance is a critical feature of the Hamilton Field Master Plan. This road provides for greater flexibility in site planning, while requiring some wetlands fill, results in a better project design.

Hamilton Air Force Base, and the project site in particular, is traversed by the main line right-of-way of the old Northwestern Pacific (NWP) Railroad. Through Federal action and funding, the right-of-way will pass into public ownership for the purpose of providing a separated public transit route from central Sonoma County south to Larkspur in Marin County. Several alternative transit systems are being analyzed. Any of the alternatives will greatly increase the use of non-automobile modes in Marin County and to San Francisco by reducing travel time and cost while improving convenience to commuters in the North Bay region.

The Hamilton Field project's proposed land use plan designates a transit station site in order to make best use of whatever transit mode operates on the NWP right-of-way. Located directly on the right-of-way, Hamilton Field will provide jobs and housing within walking distance of a substantial regional public transportation system. As stated in Section III of this report, capitalizing on this transit opportunity is a part of the Basic Purpose of the project (Appendix D).

The project is proposed for inclusion in a redevelopment area as provided for under California statute. The City of Novato Redevelopment Agency accepted a preliminary redevelopment plan for an area which includes the project site. Pursuant to the provisions of the California redevelopment law, 20 percent of the property tax increment generated in a redevelopment area and allocated to the Redevelopment Agency must be used for specific low- and moderate-income housing needs, thus promoting the affordability of proposed residential units by low and moderate income households.

The U.S. Army Corps of Engineers has taken Section 404 jurisdiction over 23.62 acres of wetland acres on the project site. This area is located in the northwest corner of the site around and to the south of Ammo Hill. Three



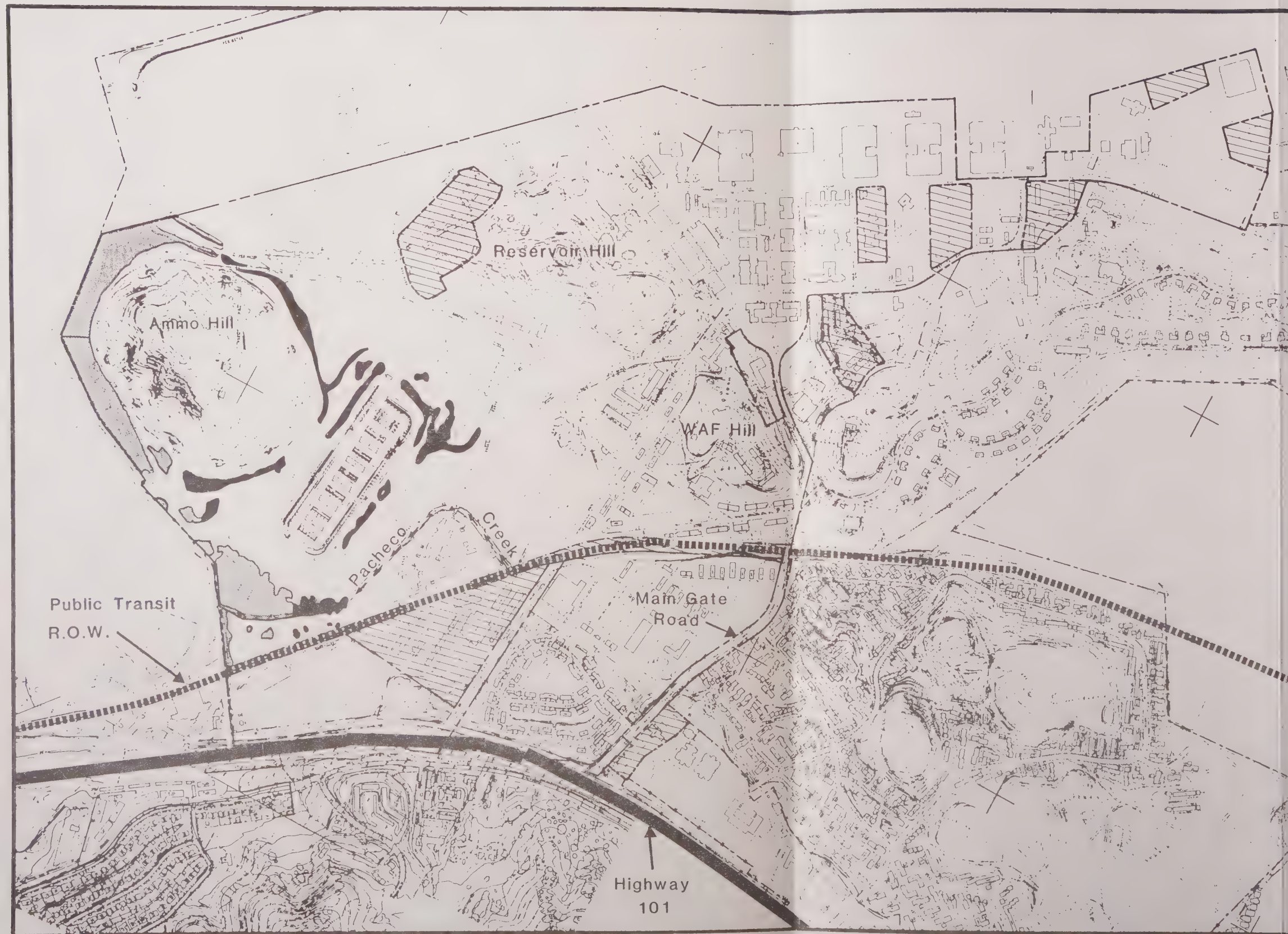
wetland types are present: willow (riparian woodland), cattail marsh, and a grass/forb association which forms a seasonal wetland.

Several isolated, man-made wetland areas that are in some instances degraded, are located primarily to the south and southwest of Ammo Hill and at the east end of the main ammunition storage bunker. Those that are at and near the east end overlay a remnant of a landfill site used in connection with on-base activity until 1974. As one of the conditions attached to the agreement on the transfer of the property to the Applicant, the U.S. Government will clean up the landfill site in preparation for redevelopment. The clean-up work will result in the loss of upwards of 4.1 acres of these wetlands located within and around the edge of the landfill area. The entire 4.1 acres is part of the 7.19 acres which would be filled by the project. Figure 2 locates the wetland areas involved in this activity.

#### PROPOSED USES

The Applicant is proposing the development of a mixed-use community consisting of three basic components: residential, business and open space (Figure 3). The specific land uses associated with each component and quantitative details regarding the uses are discussed in Project Statistics, following this sub-section.





# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
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NOVATO, CALIFORNIA 94947

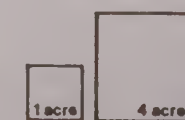
- Wetlands Filled
- Wetland Preserved

## EXISTING CONDITIONS

0 200 400 800



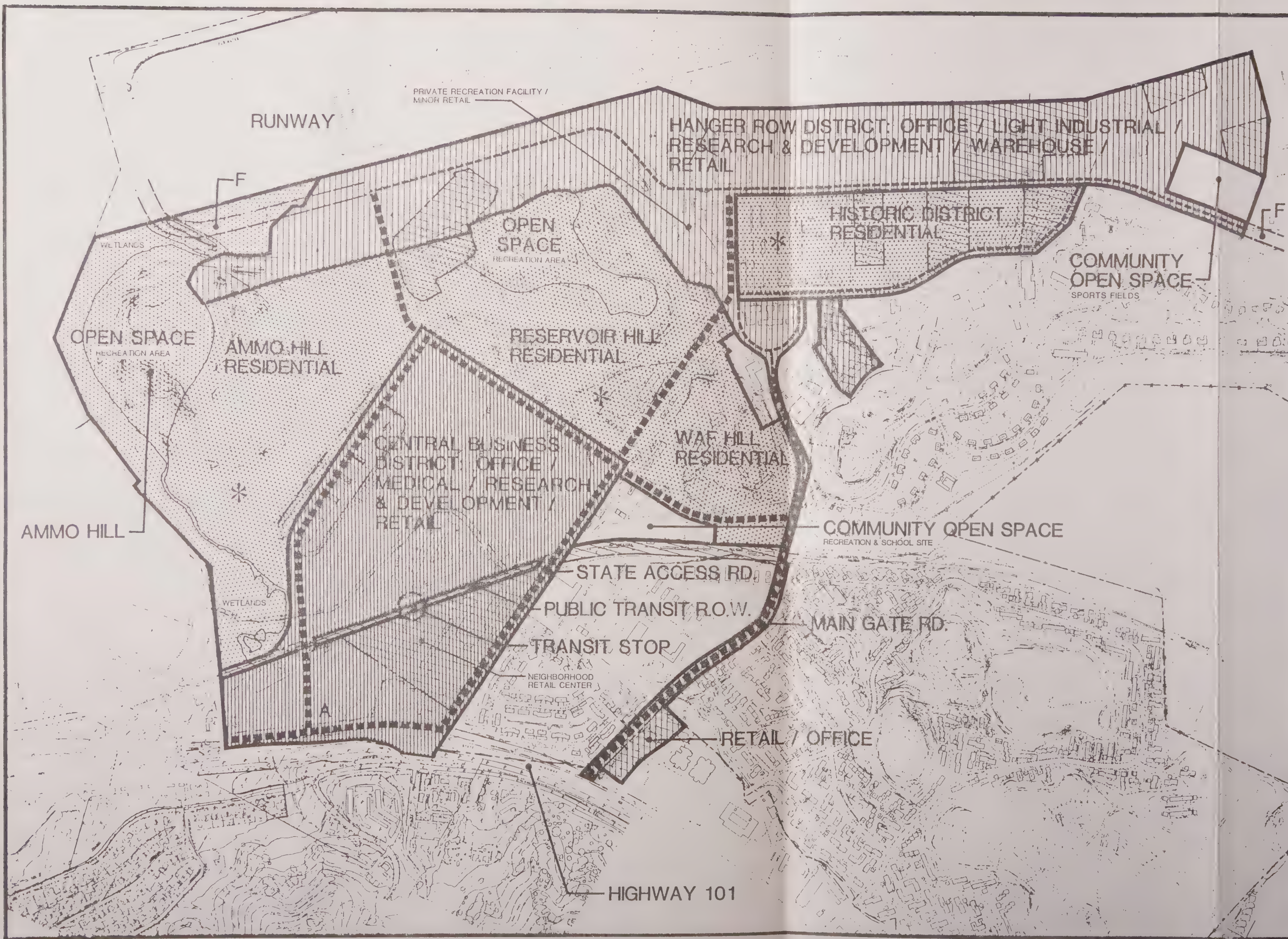
NORTH



2






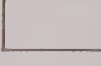




# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

December 4, 1985  
Revised April 1, 1987  
Revised September 1, 1987

-  Central Business District: Office / Medical / R&D / Retail (100.4 Acres)
-  Hanger Row District: Office / Light Industrial / R&D / Warehouse / Retail (124.8 Acres)
-  Residential (215.3 Acres)  
Includes Neighborhood Open Space.
  - A. Recreation Area - General Use (35.7 Acres)
  - B. Wetlands - No Access (23.9 Acres)
-  Community Open Space
  - A. Sports Fields - Team Sports (5.6 Acres)
  - B. Recreation & School Site - School & General Use (6.1 Acres)

\* Alternative Areas for Elderly Housing

A Frontage Road Freeway Access

■■■■ Arterial (4 lanes)\*

----- Collector / Commerical (2 lanes)\*

F Proposed McInnis Parkway Extension

\* Refer to Map #17

## LAND USE DIAGRAM

0 200 400 800







## 1. Residential Component

The residential component includes 215 acres which would be developed for residential use, including roads, and approximately 60 acres for neighborhood open space. Additional residential units may be located on the upper stories of buildings located in the proposed commercial areas. A total of 3,550 dwelling units are planned for the project in a mix of sales and rental units. Three hundred and fifty of the units are planned as "below market rate" units, priced for sale and rental to moderate-income households.

The principal occupants of most of the regular rental units and individually owned units are intended to be employees who would work at Hamilton Field. Proposed retirement rental units would be available for occupancy by elderly persons.

## 2. Business Component

Approximately 225 acres of the project site are proposed for business uses, including roads. This component primarily involves the rehabilitation of older buildings plus new construction in the new Central Business District, the Old Headquarters Area, and the Hangar Row District. Some commercial uses may be located in the residential areas, such as small convenience markets. Approximately 7,500 permanent jobs would be generated by the business component of the project and significant new tax revenues would be collected by the City of Novato, the County of Marin and various regional and special districts through property taxes, sales tax payments, and various fees.

The proposed business uses involve nine types:

A. Office Uses

690,000 square feet of office space is proposed. Professional offices, sales and administrative offices, business service uses, services and institutional uses are expected to be the major types of firms to occupy the site. Finance, insurance, and real estate businesses are expected to account for many of the potential occupants.

B. Research and Development Uses

440,000 square feet of the project site is proposed for the construction of medical research and development facilities, including the Buck Center for the Aging. An additional 300,000 square feet of the site is proposed for other research and development activities, including electronics, alternate energy applications, and telecommunications.

C. Warehousing and Light Industrial Use

The Applicant proposes 300,000 square feet of space for warehousing and 300,000 square feet for light industrial uses in rehabilitated and new buildings. The rehabilitated hangars are especially well-suited to these uses.



D. Hospital and Health Care

The Applicant proposes a 420,000 square foot hospital and health care complex in response to a proposal by Sutter Health Systems. The complex would include a general community hospital, a skilled nursing facility, and medical offices.

E. Hotel

A hotel containing approximately 200 rooms, with conference center facilities and support services is planned.

F. Retail Commercial Uses

250,000 square feet of the project site is proposed for retail commercial use. Two concentrated shopping areas are planned, a large one near the proposed transit station site and a smaller one in the Old Headquarters Area. There will be a range of restaurants, food services, and other shops and service outlets so that employees and residents of Hamilton Field can meet many of their daily needs within the project.

G. Day Care Facilities

The Applicant proposes commercial day care centers to serve the demand for child care created by residents and employees generated by the project.

#### H. Private Recreational Facilities

A private recreational complex with both indoor and outdoor facilities is proposed. Depending upon market demand, additional commercial recreational facilities would be provided.

#### I. School

The master plan reserves a six-acre parcel on State Access Road for a school/park site.

### 3. Open Space and Recreation Component

About 71 acres is proposed to remain in open space. Approximately 24 acres, or 34 percent, of this area is designated for wildlife habitat conservation in wetland areas around Ammo Hill and a proposed riparian zone along a portion of Pacheco Creek. Activities planned for a portion of other open space areas include sportsfields, parks, and children's play areas. Privately owned open spaces intended for common use are proposed within the residential and business districts.

### PROJECT SCHEDULING

The proposed project is intended to be developed in three phases over a span of ten years, depending on market conditions. The phasing plan takes into account several critical requirements, including the availability of roadway and public transit improvements, other major infrastructure improvements, and achieving a jobs/housing balance. Most of the proposed development would occur during Phase 1, with building activity occurring in

all three basic components of the project. Wetland mitigation work would occur during this early stage of development. Phase 2 involves development of open space areas and recreational facilities as well as expanding the development in Phase 1. The final phase involves the continued expansion of development as described above and the addition of a possible new sanitary pump station and force main.

#### B. PROJECT STATISTICS

The following table summarizes the proposed square feet of building area for the residential and business components:

TABLE 1  
SUMMARY OF MIXED USES

<u>RESIDENTIAL COMPONENT</u>	<u>UNITS</u>	<u>AVERAGE SQUARE FOOTAGE</u>	<u>GROSS SQUARE FOOTAGE</u>
Regular Rental Units	2,600	800	2,080,000
Retirement Rental Units	550	600	330,000
For Sale Units	<u>400</u>	<u>950</u>	<u>380,000</u>
TOTAL RESIDENTIAL	3,550	786	2,790,000
<u>BUSINESS COMPONENT</u>			
<u>OFFICE/R&amp;D/WAREHOUSING</u>			
Office & Financial			690,000
Medical R&D (Including Buck Center on Aging)			440,000
Other R&D			300,000
Warehousing			300,000
Light Industrial			<u>300,000</u>
Sub-Total			2,030,000

HOSPITAL/HEALTHCARE

Community Hospital	120,000
Skilled Nursing Facility	90,000
Other Healthcare Treatment Facilities	150,000
Medical Office	<u>60,000</u>
Sub-Total	420,000

SUPPORT COMMERCIAL

Retail/Service	250,000
Hotel	<u>200,000</u>
Sub-Total	450,000

TOTAL	<u><u>2,900,000</u></u>
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Source: Berg-Revoir Corporation, Hamilton Field Revised Master Plan, 1987.

C. SUMMARY OF LOCAL ENTITLEMENTS

The project site is zoned as a Planned Community (P-C) District. According to Chapter 19, Section 11.044 of the City of Novato Ordinances, this district is established to:

1. Permit development proposals which, due to size and character, constitute a complete neighborhood;
2. Permit flexibility in physical design and land use arrangements;
3. Encourage developments which are sensitive to and respect the

individual character of the property to be developed, including the surrounding community;

4. Permit a mix of land uses appropriately scaled and arranged in such a way that the resulting development functions as a complete and identifiably independent community neighborhood.

A General Plan amendment and Master Plan approval from the City of Novato will be required for the Hamilton Field project. It is anticipated that these entitlements will be granted to the Applicant by October 1988. Following these approvals, the Precise Plan and Tentative Map of the proposed project would require approval by the City of Novato. Design review and building permits would also be required and the grading plan would need to be evaluated.

### III. BASIC PURPOSE OF THE PROPOSED ACTIVITY

#### A. BACKGROUND

A 452-acre master-planned mixed use development is the proposed activity associated with the discharge of fill material into the earthen drainage ditches and other specified marshland and riparian areas on the Hamilton Field site.

The project Environmental Impact Report,<sup>1</sup> in Section 2.4 thereof, addressed the planning objectives of the proposed activity as promulgated by the Applicant:

The project sponsor, the Berg-Revoir Corporation, desires to design and construct a mixed use project providing housing, retirement housing, commercial and industrial land uses, office buildings, medical facilities, day care facilities, recreational facilities and related transportation and utility improvements. It is the project sponsor's expressed desire to provide opportunities for workers at all income levels, including the handicapped, provide housing for moderate income residents, and to "achieve an optimum jobs-housing balance wherein almost all of the onsite residents will be able to secure employment at Hamilton Field." It is the project sponsor's intent that the proposed project generally conform to the City of Novato's General Plan as proposed for amendment and County of Marin General Plan policies.

This statement contributes to an understanding of basic project purpose. Also to be considered is the place of the project in fulfilling regional goals that are matters of public policy. The City of Novato seeks to advance the

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<sup>1</sup>City of Novato, Hamilton Field Master Plan, Multiple Use Project Environmental Impact Report, December 1986.



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following goals through the development of Hamilton Field, these goals being officially adopted and in force:

- o To produce jobs for Novato and Marin County residents.
- o To develop Hamilton without net cost of services by the taxpayers of Novato, Marin County and Special Districts with allowance for the formation of a Redevelopment Area for Hamilton and the use of tax increment financing as a means of financing infrastructure improvements.
- o To develop the property in accordance with environmental and transportation constraints with a mix of housing and transit services that will minimize the impacts of the journey to work.
- o To incorporate energy conservation features into the development.
- o To produce job opportunities which will minimize traffic impacts, including promoting contra-flow travel in the 101 Corridor (northbound in the morning, southbound in the evening) and which would tend to siphon off some southbound traffic.
- o To achieve development with maximum benefit to the taxpayers of Novato.
- o To achieve development which meets local needs and is complementary to the existing community.
- o To develop the property as expeditiously as economic circumstances and public services availability permit.

- o To include provisions for multi-modal transportation linkages.
- o To provide for all available technologies such as energy conservation, communication linkages, bio-medical technologies, etc., in order to make any development competitive in the current and foreseeable market.

The Applicant has further interests that bear on the statement of Basic Purpose. The Applicant has concluded that a market exists for all the uses as are proposed; and to be economically viable, the total project requires the extent of development being proposed (Table 1, Section II). Because of: 1) building and site standards, regulations, densities and restrictions set forth by public agencies in local guidelines and ordinances; and 2) self-imposed development standards aimed at producing a more attractive and marketable project, the Applicant requires about 450 acres to accommodate the development being proposed.

#### B. BASIC PURPOSE STATEMENT

The Basic Purpose of the Hamilton Field project (proposed activity) can be expressed as follows:

TO DEVELOP ABOUT 450 ACRES NEAR SAN FRANCISCO IN A COMPATIBLE PLAN OF MIXED USES, EMPHASIZING PUBLIC TRANSIT AND JOBS/HOUSING BALANCE AS A SOLUTION TO CURRENT AND PROSPECTIVE REGIONAL NEEDS.

C. WATER DEPENDENCE

The Applicant agrees that nothing in the statement of Basic Purpose infers that the proposed activity, or any portion thereof, is water dependent as defined in 40 CFR 230.10(a)(3).

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#### IV. OFF-SITE ALTERNATIVES

##### A. INTRODUCTION

The Hamilton Field Project as proposed will require the discharge of fill material into approximately 7.19 acres on the site that have been determined to be wetlands. This will require a discharge permit from the U.S. Army Corps of Engineers, subject first to findings by the Corps that there exists no practicable alternative to the project as proposed and, hence, to the discharge. Under the EPA Guidelines practicable alternatives which do not involve discharge into a wetland site are presumed to exist and to have less adverse environmental effects on the aquatic ecosystem. These presumptions place the burden of proof on the Applicant to demonstrate otherwise.

Practicable alternatives may exist either as alternatives to the project site or alternative configurations of the internal project design on the project site. This section of this report, Section IV, addresses the first class of alternatives, often referred to as external, or off-site alternatives.

The universe of potentially suitable off-site alternatives is theoretically limitless, but is practically constrained by a three-tiered screening process designed to introduce into the analysis the environmental, social and economic considerations against which the practicability of any site must be measured. The considerations influence both the Basic Purpose of the project and the specifics of the site development program proposed by the Applicant.

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## B. DELINEATION OF THE MARKET AREA

The first tier of analysis delineates the market area of the project.<sup>1</sup> The market area of a project is the geographic region wherein like developments will provide a similar return over a similar period of time, given the Basic Purpose of the project. The market area serves as the area in which alternative sites are possible, as lease/sale rates will generally be comparable, while outside the market area these rates will tend to be different, resulting in non-comparable alternatives. Given his objectives, a developer would be highly unlikely to depart his market area in the search for alternative sites.

The Hamilton Field Project presents some unique considerations when defining the market area in which it is economically viable. Overall, the project is an effort to accommodate a portion of the growth projected for this urban region in the next several decades. In the past, Hamilton Field bustled with military and civilian activities in its own urban setting. In recent years, disuse and under utilization of buildings and infrastructure has created some blighted conditions on the site that the City of Novato wishes to see corrected.

The proposed project accommodates growth by consolidating it and by relating it to an in-place infrastructure at an in-fill location, so that the

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<sup>1</sup>The term "market area" applies to projects, such as the Hamilton Field Project, from which a positive economic return is anticipated and is a development objective of the Applicant. In the case of public or not-for-profit projects, the term "service area" might be more appropriate. In either case, the area may be conceived of as the "study area", the more abstract term that defines a geographic scope for the purpose of a spatially-related analysis.

growth does not result in a continuation of regional transportation and housing problems. Such an accommodation will not work unless it relies on existing transportation corridors and on large land sites within those corridors that can accommodate developments large enough to strike a jobs/housing balance, including moderate-income housing, and still be economically feasible. Thus, within the economic market area for the Hamilton Field Project, alternative sites readily accessible to Highway 101 and the NWP line are the only viable ones.

### C. APPLICATION OF EXCLUSIONARY CRITERIA

The second tier in the screening process examines the market area in more detail and excludes from further consideration any lands that, prima facie, are so absolutely and inarguably constrained that they cannot qualify for any finer analysis. Exclusionary criteria used are the following:

- o All developed land, except land in agricultural production, where the economic life of the improvements is sufficiently long to cause them to be considered permanent, for all practical purposes, and where the land and improvements are not blighted or otherwise clearly eligible for redevelopment in the near future, under the laws of the State of California.
- o Ecologically important undeveloped lands, such as sensitive bayland habitats, excluded from development by the policies of the adopted San Francisco Bay Plan and similar regional plans in this portion of Marin and Sonoma counties.



- o Open space dedicated in perpetuity to a public or quasi-public entity as part of a planned open space system or as a permanent open space requirement of an adjacent or surrounding development.
- o Lands outside any officially-adopted urban service area boundaries of the counties of Marin and Sonoma, on the reasonable assumption that such a boundary constitutes a barrier to urban development for the foreseeable future because no supporting urban services will be extended beyond it under any practicable circumstances.
- o Any lands under military ownership or control that are not now, nor scheduled to become surplus property and disposed of in accordance with the mandated procedures of the U.S. Government.

#### D. DESCRIPTION OF SPECIFIC SITE EVALUATION CRITERIA

In addition to the exclusionary criteria which were used to initially screen the potential alternative sites, the sites were further evaluated based on a more detailed set of criteria. The following criteria were used to determine whether each site would meet the Applicant's basic purpose and whether development on the site would be feasible from a land use, environmental, and economic standpoint:

1. Site Acreage. The proposed project requires approximately 450 acres of land. Optimally, for a similar project to be developed elsewhere in the market area, an alternative practicable site must also approximate this acreage requirement.
2. Wetlands Fill. The alternative site should not require the filling of special aquatic areas to an extent equal to, or greater than the

fill requirement of the plan for the proposed site. This fill requirement is about seven acres.

3. Land Availability. Alternative sites must be available for the proposed development in the near term, i.e., two to three years, to reduce holding and finance costs. For example, parcels of land on which there are proposed, approved or pending development plans or which are maintained as agricultural preserves under the Williamson Act are not considered to be available.
4. Environmental Hazards. The potential environmental impacts resulting from construction of the proposed project should not be significant or, if significant, can be mitigated at a reasonable cost. An alternative site cannot be significantly constrained by flooding, slope stability, faulting, aircraft overflights or other similar hazards.
5. Land Costs. The cost of acquisition of an alternative site should not exceed the cost of acquiring the proposed site. It is critical to maintain competitiveness within the market area to keep this fixed cost the same as the cost of an alternative site, should one be selected.
6. Development Costs. The cost of developing an alternative site, such as costs for water supply, grading, utility extension needs, and environmental mitigation should not exceed costs estimated for the proposed project site.
7. Utilities Availability. Given existing conditions in the market area, alternative sites must have utilities, principally water and

sewer, allocated, committed, or otherwise available to them in the near term with comparable characteristics as that which is available to the proposed site.

8. Multi-Modal Access. The alternative site should be within a public transportation corridor which provides easy access to freeways and other modes of transportation. In order to fulfill the Basic Purpose of the proposed project, ease of access to U.S. Highway 101 and the unused Northwestern Pacific Railroad Right-of-Way is an important consideration, but the possibility of there being another transportation corridor offering equivalent advantages is not, a priori, ruled out.
9. Land Use Compatibility. An alternative site should not be adjacent to existing or planned land uses with which the proposed development would be environmentally, visually, economically or otherwise incompatible, to the detriment of either the proposed uses or the surrounding ones.
10. Proximity to San Francisco. The alternative site should be in close proximity to San Francisco because the project contains proposed activities (such as the Buck Center) that are dependent, to an important extent, on institutions, services and users located in the City, but for which City land costs and building rents cannot be considered as economical. In a regional context, the City of San Francisco and the in-lying communities of southern Marin offer a large and broadly based labor force for uses in the proposed project. A one-hour driving commute reasonably defines the upper limit of proximity to the City, for the purposes of this analysis.

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## E. SITE IDENTIFICATION

In December of 1987 and January of 1988 a reconnaissance of the market area delineated in Section IV-B of this report was undertaken to identify and evaluate sites not subject to exclusion under Section IV-C and which, therefore, might qualify as practicable off-site alternatives, pending application of the specific site evaluation criteria listed in Section IV-D above.

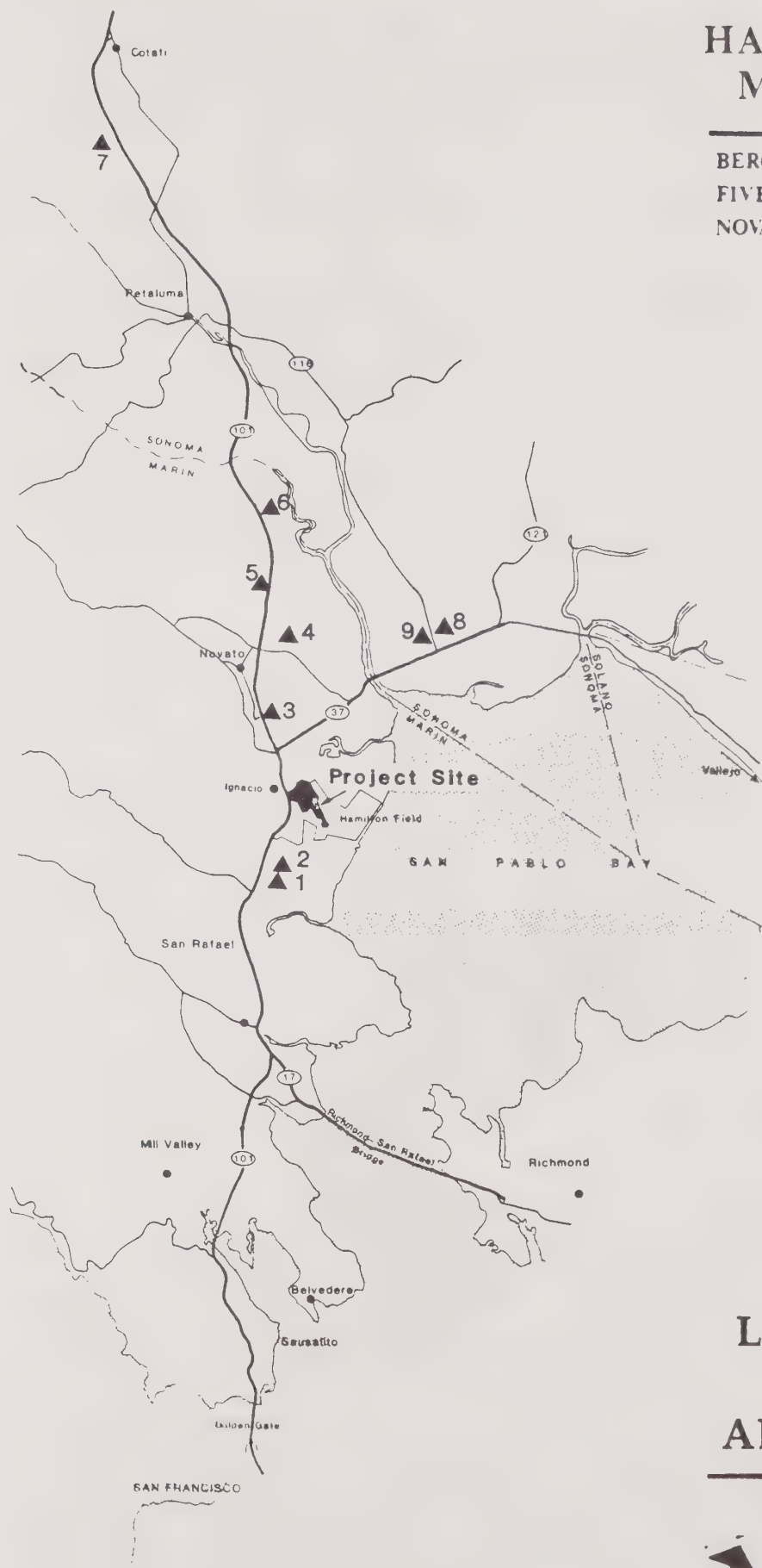
The reconnaissance focused first on a search for undeveloped sites approximately 450 acres in size to determine if the Basic Purpose of the proposed project can be achieved on contiguous acreage elsewhere in the market area.

Nine undeveloped sites were identified as being large enough to warrant further consideration (Figure 4). The particular characteristics of each of these sites are provided in detail in Appendix C. The following is a summary evaluation of the nine sites.

1. Site 1 - Silveira Ranch. This 450-acre site is located in unincorporated Marin County, east of Highway 101, north of Gallinas Ridge and south of St. Vincent's School. It is about 2 miles south of the proposed project site. Currently, the site is used for agricultural purposes, and contains a residence. Almost all of the site is relatively flat and open; oak-covered hills up to 200 feet in height are off the site to the south. The NWP Right-of-Way crosses the site about 4,000 feet east of Highway 101 and generally parallel to it. The area east of the NWP Right-of-Way is diked baylands and is subject to flooding. Miller Creek runs along the

# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947



## LOCATION OF OFF-SITE ALTERNATIVES

0 1 3 MILES



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northern boundary of the site. The vegetation of the creek is riparian, composed of arroyo willow, California bay, and coast live oak. It covers an area of approximately 2.5 acres. In addition, other wetland areas were identified on the southern portion of the site, totalling approximately 43 acres. Therefore, approximately 45.5 acres of wetland may be subject to U.S. Army Corps of Engineers jurisdiction, not including the diked baylands which represent about 60 more acres.

Site 1 is not considered a practicable alternative to the proposed site. One critical reason is its unavailability and an unsettled political climate that may act to delay development decisions beyond a point that is practicable to the Hamilton Field Applicant. The property owners report that they are currently proposing development on the site. In addition, the Silveira Ranch site has been the subject of a potential Countywide Plan amendment which is intended to limit development and may be in conflict with the owners' intentions and even the Basic Purpose of the Hamilton Field plan. A new Marin County jail is being seriously considered for a part of the property, and this project may not be compatible with more conventional future development on the site.

Site 1 is also less practicable than the Hamilton Field site because of more extensive wetlands and the diked baylands. To accomplish the Basic Purpose of the Hamilton Field project would require more filling on Site 1 than is proposed at Hamilton Field.

The local sewage treatment district reports that sewage treatment facilities are almost at capacity and they currently do not have capacity to serve a project on the scale of the proposed Hamilton Field project. (J. Emmanuel, Engineering Manager, Las Gallinas



Valley Sanitary District). Although the agency is studying ways to expand capacity, no plans for expansion currently exist and no service to Site 1 is likely in the near term.

2. Site 2 - St. Vincent's. This 449-acre site is located in unincorporated Marin County, east of Highway 101, north of and adjacent to Site 1 (Silveira Ranch Property). The site is currently used as St. Vincent's School facilities and grounds. The northern and western portions of the site have relatively steep terrain. Pacheco Hill, at an elevation of 454 feet, is located at the northern boundary of the site. The area east of the NWP Right-of-Way, some 150 acres is diked baylands and subject to flooding. An unnamed drainage flows from the highway toward an orchard in front of the school complex; this drainage has an associated area of riparian vegetation of about 1.1 acres. Additionally, two wetland areas on the southern portion of the site cover approximately 14 acres. These wetland areas occupy approximately 15.1 acres and may be subject to U.S. Army Corps of Engineers jurisdiction.

Important considerations preclude Site 2 from being developed as an alternative site. Nearly all of the property is owned by a non-profit corporation, the Youth Activities of the Archdiocese of San Francisco, Inc. For the purposes of this analysis, the school facilities are permanent, in that the Archdiocese does not plan to terminate the use in the next 2-3 years. There are future plans for a mixed-use development on the project site.

The development costs associated with the Basic Purpose of the proposed project would be high on Site 2 since extensive grading would be needed that is not needed at Hamilton Field. Costs for water supply and utility extension needs would exceed costs

estimated for the Hamilton site, since the latter site has a more developed existing infrastructure.

Site 2 is in the same sewage treatment district as Site 1 (Las Gallinas Valley Sanitary District) and development is also severely constrained by the lack of additional sewage treatment capacity.

Finally, Site 2 possesses similar problems with developability due to diked baylands as did Site 1, and it is constrained by wetlands west of the NWP Right-of-Way. Retention of all potential aquatic sites would remove from use upwards of 40 percent of the property, leaving an insufficient amount to achieve the project Basic Purpose.

3. Site 3 - Deer Island. The Deer Island site is in the City of Novato, east of Highway 101, north of Highway 37, south of Novato Creek and west of the NWP Right-of-Way. It is about two miles north of Hamilton field. Nearly the entire site is flat and covered with grasses. Drainage canals and sloughs, both of which are considered wetland, cover about 6 acres. The entire Deer Island site may be subject to U.S. Army Corps of Engineers jurisdiction. The land is currently vacant and undeveloped.

Of this 395-acre site, only 29 acres actually remain for potential development, the rest being unavailable as an alternative to Hamilton Field. 240 acres are owned by the State of California and are set aside for conservation under the California Land Conservation Act. A 106-acre portion of the site is pending approval for a shopping center development, and this is an activity highly desired by the City of Novato. Residential development is already approved for about 20 acres of the site.

The Deer Island site is surrounded by levees and is entirely below sea level. Consequently, the site is subject to potential flooding. Development costs associated with the filling of the low-lying areas would be extremely high.

4. Site 4 - Pinheiro Ridge. The Pinheiro Ridge site is located in unincorporated Marin County, east of Highway 101, north of Atherton Avenue, and south of Rush Creek. Overall site topography is composed of relatively steep slopes on the sides of an east/west trending ridge. This undeveloped site contains three major vegetation types: grassland, oak-grassland and mixed evergreen. The oak-grassland covers the majority of the upland areas of the site while mixed evergreen forest is largely found on the north-facing slopes of the ridge. Adjacent uses include residential areas to the south and Rush Creek and associated wetlands to the north.

The Marin Countywide Plan designates the site as low density residential development on the south-facing slopes and conservation district on the north-facing slopes. Therefore, the land on the northern portion of the site is not intended for development. The remaining acreage on the project site would not fulfill the acreage requirement of the project. Also, the NWP Right-of-Way is near Site 4 but does not traverse it, meaning that the site has a less than optimal relationship to the major transportation corridor.

This site would also be constrained from development because of potential geologic hazards. Because of the steep, unstable terrain, the potential for landslides exists on the site. Also, previous geologic mapping in the vicinity of the site has revealed a zone of

faulting termed the Burdell Mountain fault. In addition, the low lying area on the northern edge of the site is subject to flooding.

5. Site 5 - Burdell Mountain. The 488-acre Burdell Mountain site is located in unincorporated Marin County, west of Highway 101, approximately two miles north of San Marin Drive. The site abuts Olompali State Park. Vegetation types found at the site include grassland, chaparral, and woodland-savanna. No indications of wetland areas are present.

Approximately 406 acres of the Burdell Mountain site lies within an "Inland Rural Corridor" as designated in the Marin Countywide Plan. By County policy, this corridor is not intended for the character of urban development that fulfills the Hamilton Field Basic Purpose. Therefore, the majority of the site is not intended for intense development and is unavailable, for practical purposes. The remaining acreage not included in the Inland Rural Corridor, about 82 acres, would not fulfill the acreage required by the project.

Access problems to Site 5 are a major constraint. Development of the site in accordance with the project's Basic Purpose would create potentially significant traffic impacts on the surrounding streets and Highway 101. High development costs would be associated with traffic improvements around the site to fulfill the project's Basic Purpose, including the costs of constructing a full interchange with Highway 101, and constructing an overpass or underpass connection to the NWP Right-of-Way, which lies east of the Highway.

Potential geologic hazards are present on the site. Most of the slopes are too steep for any intensive development, which is an



evident reason why the County advocates a rural character for the area. Areas of landslide debris occupy much of the surface in the site vicinity. The project site is within the Burdell Mountain fault zone, a zone of related, intersecting, and lateral fractures.

6. Site 6 - Olompali East. Site 6 is located in unincorporated Marin County, east of Highway 101, west of the NWP Right-of-Way, and south of San Antonio Road. It is directly across the highway from Olompali State Park. Currently, this 479-acre site is open space, grazed, and contains a small sand and gravel operation. Two relatively steep hills are located on the site, the taller one is 425 feet and the other is approximately 160 feet. Flat terrain exists between the two hills and on the southern portion of the site. The eastern boundary of the site is diked baylands and is subject to flooding. A sanitary landfill operation is active adjacent to the eastern boundary; access to the landfill is across Site 6. Wetland areas on this site include an unnamed creek, a pond, and former marshlands separated from San Antonio Creek by the NWP Right-of-Way. The creek covers one acre of the site. The other wetland areas on the eastern portion of the site cover approximately 50 acres. In total, approximately 51 acres of wetland may be subject to U.S. Army Corps of Engineers jurisdiction.

The majority of the site, 394 acres, is under a Williamson Act contract and is, therefore, not necessarily available for development in a reasonable time frame. Even if obtainable, the site would have major development costs associated with the installation of infrastructure because there are no existing utilities serving the area. In addition, Highway 101 is not constructed to freeway standards near or adjacent to the site; to

fulfill the project Basic Purpose, a substantial upgrading of the highway, including a grade-separated interchange to serve the site, would have to occur before the system in fact operates as an efficient multi-modal transportation corridor.

7. Site 7 - Stony Point Road. Site 7 is located in unincorporated Sonoma County. It is bounded by West Railroad and Jewett Avenue to the northwest, Pepper Road to the south, and Highway 101 to the east. Eleven parcels in various ownerships make up the site, totalling about 455 acres. The site is currently used for agricultural activities and rural residences. The majority of the site is flat, with relatively steep slopes on the northern and eastern portions. Wetlands at this site includes two drainages and shallow ponded water. The drainages average 5 feet wide for much of their length. Arroyo willows are the dominant vegetation along them. The drainages cover approximately 2 acres and the pond is about 1.5 acres. These wetland areas, totalling about 3.5 acres, may fall under U.S. Army Corps of Engineers jurisdiction.

Site 7 is not a practicable alternative because 160 acres of the site is unavailable due to agricultural preserve status. In addition, the project site is designated as a "Community Separator" in the Sonoma County General Plan. By County policy, land in a Community Separator is not intended for urban development of the kind that fulfills the Basic Purpose of the Hamilton Field Project. The objective of the Community Separator is to maintain individual community identities by retaining an open or very rural character in between the communities. Site 7 is part of the Meacham Hill separator which separates Petaluma from Rohnert Park-Cotati. Practically speaking, Community Separators are outside of urban



service areas, and lands therein could technically be eliminated from this alternatives analysis under the provisions of Section IV-C of this report.

Even if the site were readily available for development, high development costs are present and include access to Highway 101, flood protection, sewage treatment facilities, and provision of an adequate water supply.

This site is more than a mile from the NWP Right-of-Way. It is also the most distant from San Francisco and, at best, represents the outer limit of any of the alternatives, in that commute time to the City would be one hour.

8. Site 8 - Lakeville Road East. Total acreage of Site 8 is 485 acres. The site is located in unincorporated Sonoma County, east of Lakeville Road, and north of Highway 37. Most of the site has hills with oak-woodland on them while the flat areas are covered with grasses. The land is currently undeveloped except for a residence complex; the land is mainly used for grazing and oat hay production.

Both Highway 37 and the Lakeville Highway, which are adjacent to Site 8 and Site 9, are designated in the Sonoma County General Plan as Scenic Highway Corridors. The purpose of these corridors is to establish areas in which to preserve roadside landscapes of high visual quality. The Basic Purpose of the proposed project involves extensive urban development which would not conform to the County policy with respect to Scenic Highway Corridors. This would constrain site utilization and reduce the acreage available for development.

Development constraints associated with Site 8 include the absence of freeway-level accessibility, flooding, earthquake hazards (the site is close to the Tolay fault), lack of sewage treatment facilities, and lack of an adequate water supply. Costs associated with sewage and water supply would be high. Previous studies by the landowners concluded that an on-site sewer plant costing approximately 2.5 million dollars would need to be constructed. In addition, the studies showed that there are three alternatives to supplying water to the site. The cost of the least expensive option would be over five million dollars to install a desalinization system which would use bay water or brackish well water, assuming permits could be obtained. The most expensive method would be the construction of a new water transmission line from the Russian River to the project site which would cost approximately 16 million dollars.

9. Site 9 - Lakeville Road West. Site 9 is comprised of several parcels of land in two major ownerships totalling approximately 483 acres. The site is located in unincorporated Sonoma County, west of Lakeville Road, and north of Highway 37. Currently, the site is used on a seasonal basis for grazing and hay production purposes and is available for purchase. Nearly the entire site is flat and within the 100-year flood zone. Wetland vegetation occurs within the drainage ditches on the southern portion of the site. These areas may be under U.S. Army Corps of Engineers jurisdiction.

The entire site is designated as a Scenic Landscape Unit in the proposed update to the Sonoma County General Plan. The purpose of Scenic Landscape Units is to maintain the openness of these areas

which, in turn, would provide important visual relief from urban landscapes. The proposed General Plan states that: "Pasture lands along the Highway 37 corridor are included to preserve views of the San Pablo Bay." The proposed policies associated with the goals of the proposed General Plan state that: "Commercial or industrial land-uses shall not be permitted in designated scenic landscape units and that permitted residential densities shall not exceed one dwelling unit per 10 acres." It is evident that County policy would conflict with the project Basic Purpose. Based on the experience of the current landowners, there is no likelihood of a reversal in County policy within a 2-3 year period, making the site unavailable as a suitable alternative for the Hamilton Field Project.

Potential significant impacts, if development were to occur, include flooding, earthquake hazards (the site is close to the Tolay fault), extension of sewage facilities and water supply. The lack of freeway-level transportation also affects the practicability of this site.

10. Site 10 - Hamilton Field. The Applicant proposes this site which is located on a portion of the former Hamilton Air Force Base. Most of the site has been acquired and all of it has been planned to meet the Applicant's Basic Purpose for the Hamilton Field Master Plan. Site 10 adequately satisfies all of the specific site evaluation criteria listed in Section IV-D, most of which were originally considered by the Applicant in formulating the project. Figure 5 evaluates Site 10 against the specific criteria and compares the proposed site against the alternatives.

## F. CONCLUSIONS

The analysis of off-site alternatives reveals no practicable alternative to Site 10, the proposed Hamilton Field site. Most of the off-site alternatives studied herein are either wholly or partially unavailable due to current development plans by their owners, agricultural preserve status, Community Separator status, lack of sewer or water service, or other reasons of local public policy. Indeed, it is well known that throughout the market area in Sonoma and Marin counties, extremely strong pressures from the established environmental community have influenced local public sentiment to favor and endorse relatively restrictive growth management controls. One result of this exercise of public policy is to limit the short-term (2-3 years) availability of land for any use contrary to environmentally oriented policies, withstanding the social or economic value of proposed development projects. None of the off-site alternatives have enough available acreage to fulfill the Basic Purpose. Six of the nine sites contain wetland areas that potentially could be impacted by development to an extent at least equal to or greater than the proposed site.

Flooding would be a primary environmental hazard associated with the development of many of the off-site alternatives. Geologic hazards, such as steep slopes and close proximity to an earthquake fault, are other constraints to development on many of the sites.

Development costs would be high for all of the sites because they would need major infrastructure improvements, such as sewer and water service, in order to serve the Basic Purpose. Regardless of cost, some of the sites will simply have no sewer or water allocations in the foreseeable future. Several of the sites would require improved access to Highway 101, to the extent of major construction of new interchanges.



FIGURE 5. SUITABILITY MATRIX FOR PROJECT AND OFF-SITE ALTERNATIVES

Site	Site Acreage	Wetland Fill	Land Availability	Environmental Hazards	Land Costs	Development Costs	Utilities Availability	Multi-Modal Access	Land Use Compatibility	Proximity to San Francisco
1. Silveira Ranch	●	○	○	○	●	●	○	●	●	●
2. St. Vincent's	●	○	○	○	◐	●	○	●	◐	●
3. Deer Island	●	○	○	○	●	○	●	●	○	●
4. Pinheiro Ridge	●	●	◐	○	●	○	●	●	○	●
5. Burdell Mountain	●	●	○	○	●	○	◐	●	○	●
6. Olompali East	●	○	◐	○	◐	○	◐	◐	◐	●
7. Stony Point Road	●	●	○	◐	●	◐	◐	◐	◐	◐
8. Lakeville Road (East)	●	●	◐	◐	●	○	○	◐	○	◐
9. Lakeville Road (West)	●	○	○	○	●	○	○	◐	○	◐
10. Hamilton Field (Proposed Site)	●	◐	●	●	●	◐	●	●	●	●

Source: LSA Associates, Inc.



Satisfactory



Limiting



Severely Limiting or Unworkable

---

## V. ON-SITE ALTERNATIVES

Practicable alternatives for a non-water dependent project may exist either as alternatives to the project site or alternative configurations of the project design on the project site. Section IV addressed the first class of alternatives, the off-site alternatives. The scope of this section, Section V, is the latter class of alternatives more commonly known as the on-site alternatives.

Generally speaking, on-site alternatives are of four kinds: alternatives that avoid or reduce fill in special aquatic sites by: (1) reducing the size of the project; (2) by rearranging the project on the site; (3) by acquiring adjacent lands to expand the project site sufficient to accommodate both wetlands and development; and (4) a combination of any of the above.

As a rule, on-site alternatives should represent a feasible range of design possibilities. In this respect, three alternatives were identified and evaluated for the Hamilton Field site as follows:

### A. ALTERNATIVE 1 (ADJACENT LANDS ALTERNATIVE)

Properties adjacent to the project site were examined for the availability of up to about eight upland acres which might then be developed for project purposes in lieu of filling any wetlands on the site. Figure 6 is a simplified diagram that orients the reader to the Hamilton Field site and its immediate environs.

The site is relatively constrained by existing adjacent uses. Immediately to the south and east lie those remaining portions of Hamilton



Field, including the runway that will continue in use under the control of the military. No further surplus property will result from the military operations. Therefore, these adjacent lands to the south and east are unavailable to potentially satisfy this alternative.

To the west, the site is bounded by U.S. Highway 101, which acts as a barrier to development and a clear division between land uses on either side of it. The flatter area to the west is already developed or committed to development, but even if about eight acres could be made available, it would be physically impossible to connect those acres with Hamilton Field without a prohibitively expensive bridging or underpassing of the freeway and its frontage road system.

The Los Robles Mobile Home park and Ignacio Industrial area has been constructed immediately north of the project site, and residential construction within the Bel Marin Keys waterfront community has occurred directly northeast of the project site.

The Ignacio Industrial area has been developing since 1970 and contains about 125 acres of land in three industrial parks: Hamilton Industrial Park, Bel Marin Commerce Park, and Ignacio Industrial Park. Occupants generally represent relatively small semi-commercial, light industrial, and distributing activities. As shown in Figure 6, the Army Corps of Engineers required dedication of a major portion of the area for permanent wetlands as mitigation for filling the area required for construction of the industrial area. Some of this is the area immediately contiguous with wetlands at the base of Ammo Hill that are proposed as permanent open space in the Hamilton Field plan.

The Bel Marin Commerce Park is the closest of the industrial parks to the project site. Some industrial/commercial lots remain for sale, but they are

scattered and not practicably capable of being integrated into the Hamilton Field project site. The mobile home park has no land available, and the development itself is a permanent use. It is, in fact, a "locked gate" community that is attractively landscaped and has a substantial community facility building as the keystone of the on-site amenities available to its residents.

In summary, Alternative 1 is not a practicable alternative in that no lands lie adjacent to the proposed site that could feasibly be used in an alternative plan to meet the project basic purpose.

#### **B. ALTERNATIVE 2 (NO-FILL ALTERNATIVE)**

Figure 7 shows the on-site alternative in which the 7.19 acres of wetlands under consideration would not be filled. Because of the size and locations of the 13 separate, relatively small and highly accessible aquatic sites that comprise the 7.19 acre resource, the no-fill alternative assumes a six-foot high fence will be installed around the edges of each wetland area. This is a cost-effective method for minimizing direct intrusions to the aquatic environment. However, small isolated wetlands surrounded by development will lose substantial habitat value and an increase in feral and pest animals (cat, rats) will further decrease habitat values. The quality of water reaching the wetlands would be degraded by urban pollutants and the quantity would also change.

One result of not filling these sites will be to create small or narrow spaces between some of them that are too small to be buildable sites. Depending on where they are, these spaces may be adequate only for minor roads, walkways, some limited parking, service yards, and small recreation facilities. However, even such minimal improvements will require earthfill and changes in surface grading patterns.

If these small spaces were not developed for minimal use but were left in their original state, they would add an estimated four more acres to the land left in open space under this alternative. From the applicant's perspective, this reduction in developable land in the small spaces represents a loss of \$1.2 million, based on the original per acre purchase price.

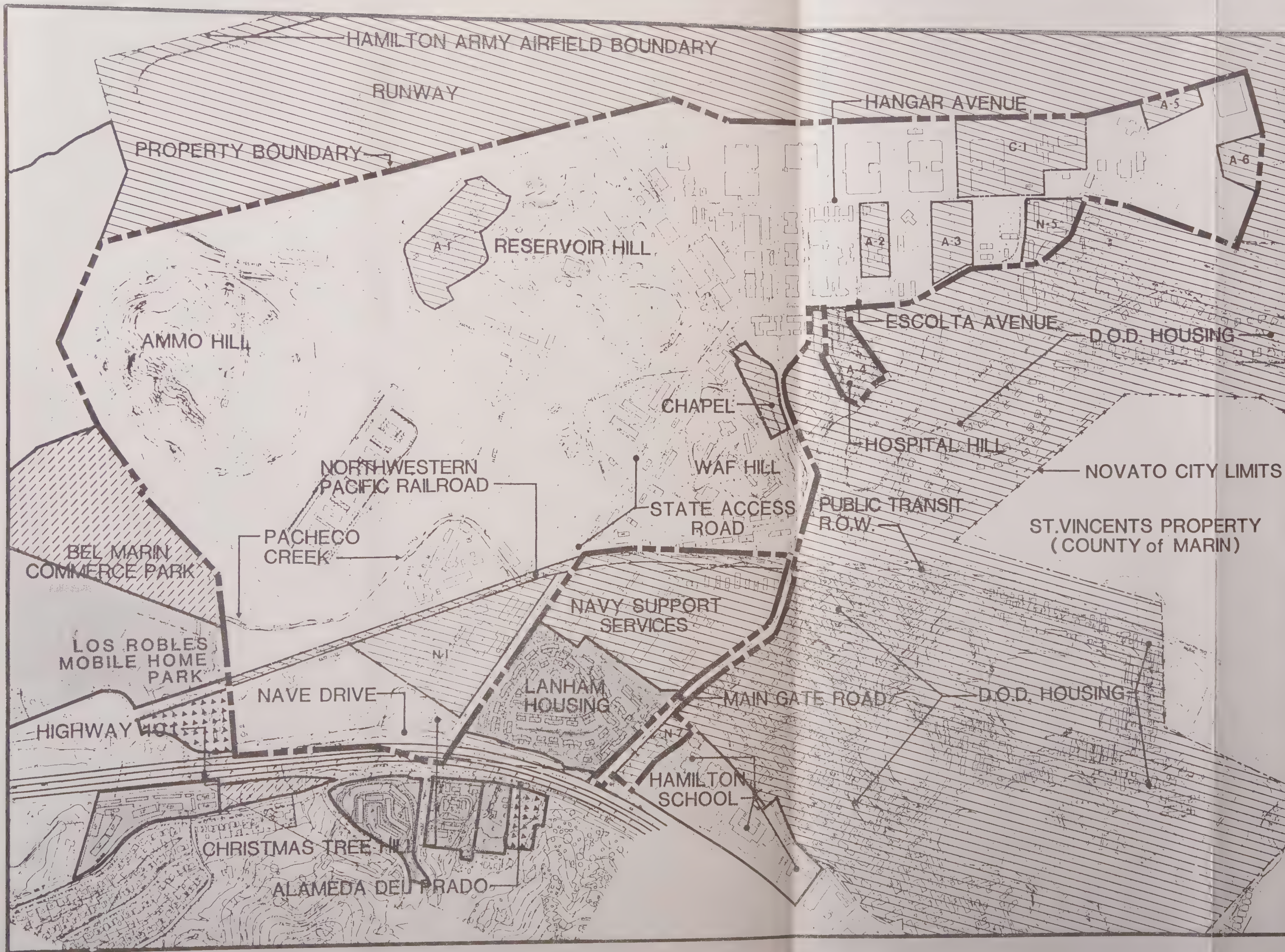
A critical implication of the no-fill alternative would be the need for a revised alignment for the proposed new main entrance road to the project. Preservation of the aquatic site near the NWP right-of-way constricts the road alignment to passing through a very narrow opening. This will create an oblique, rather than perpendicular crossing of the railroad, which is not desirable. It also prevents road geometrics from creating an alignment around the perimeter of the commercial core, effectively separating the office uses from the Ammo Hill residential area. Instead, the road would bisect the core of the office area as shown in Figure 7. As a result of the road bisecting the core office area and the retention of the small wetland areas, central common areas and plazas lose the continuity desired and the pedestrian atmosphere of the core area is severely compromised. Parcelization feasibility is significantly affected, requiring a reparcelization which results in a reduction of the economic return on the land. The result is a project which is not practicable to build.

### C. ALTERNATIVE 3 (PARTIAL FILL ALTERNATIVE)

Based on the fact that the 7.19 acres proposed to be filled to achieve the project Basic Purpose involve 13 separate, relatively small aquatic sites ranging in area from .032 acre (1,394 sq. ft.) to 1.48 acres, a large number of on-site alternatives theoretically exist on a continuum from filling anywhere from 12 to filling only one of the sites. Each such partial alternative represents a reduced fill option, even though some are only







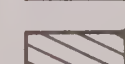




# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

December 4, 1985  
Revised April 1, 1987  
Revised September 1, 1987

-  Residential
-  Commercial
-  Office and Industrial
-  Public, Institutional
-  Military

## ON-SITE ALTERNATIVE 1 - ADJACENT LANDS ALTERNATIVE

0 200 400 800



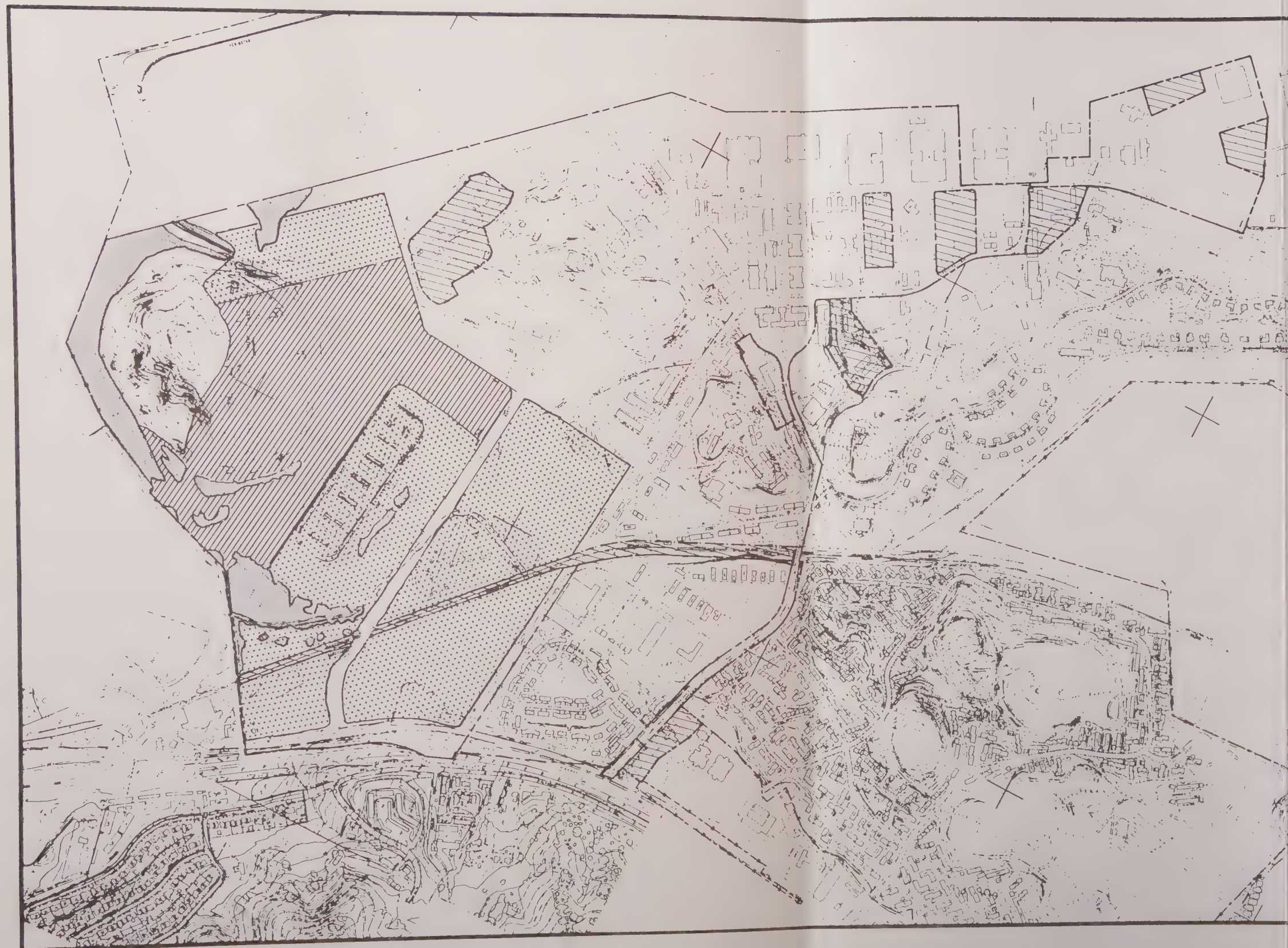
1 acre

4 acres




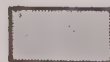








## HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

-  Military
-  Preserved Wetlands
-  Residential
-  Central Business District

### ON-SITE ALTERNATIVE 2 - NO-FILL ALTERNATIVE

0 200 400 800



1 acre



4 acres

7



marginally different from the proposed project.

This continuum of partial fill alternatives is acknowledged, but each discrete option on the continuum is not addressed herein. The practical problems associated with retaining one or more of these small, irregular shaped areas in the midst of a Planned Community District are similar to those difficulties documented under Alternative 2, No-Fill Alternative, such as the hydrologic impacts of changes in surface drainage patterns and the loss of habitat values when surrounded by urban development.

The Applicant has also given consideration to an alternative that fills only those aquatic sites, or portions thereof, that enable the new main entrance road to be aligned and constructed as proposed. Presumably, this would eliminate a major objection raised to Alternative 2. To retain the original alignment will require filling almost one acre (Appendix D). Thus, while the integrity of the road plan is maintained, little in reality would change from Alternative 2 in that the major land uses would be disrupted and the aquatic sites themselves would potentially deteriorate over time. Under this alternative, some additional upland areas straddling the road near its northeastern end would be constrained from development because these areas become too small as residual parcels if wetlands around them are maintained at the same time the road alignment is maintained. In analyzing this alternative, the Applicant found that about two acres would lie between the road and the major drainage ditches and that development opportunities would be seriously diminished on those acres.

#### D. CONCLUSIONS

Upon review of the plausible on-site alternatives to the proposed plan for Hamilton Field, none offered a practicable option. No adjacent land was



found to be a candidate for development for reasons cited in Section V-A. The No-Fill Alternative physically constrains the fulfillment of the project Basic Purpose. The loss of land and loss of parcelization flexibility is considered excessive resulting in a project which is not practicable. The variety of Partial Fill Alternatives, including an alternative that fills only those aquatic sites necessary to facilitate a favorable new main entrance road alignment, do not significantly improve the ability of the plan to achieve the project Basic Purpose or provide greater habitat values.

APPENDIX A

LETTER TO APPLICANT FROM U.S. ARMY CORPS OF ENGINEERS  
ADDRESSING WETLANDS JURISDICTION



DEPARTMENT OF THE ARMY  
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS  
211 MAIN STREET  
SAN FRANCISCO, CALIFORNIA 94105 - 1905

Regulatory Functions Branch  
No. 16353N83

FEB 3 1986

Mr. James Revoir  
Berg-Revoir Corporation  
Hamilton Field  
500 Palm Drive  
Novato, CA 94947

Dear Mr. Revoir:

This is in response to your request, dated October 7, 1985, for a jurisdictional determination for a parcel of land (formerly a part of Hamilton Air Force Base) bounded by Nave Drive to the west, the Hamilton Air Force Base airstrip to the east, State Access Road to the south, and Pacheco Pond to the north, in the city of Novato, Marin County, California.

All proposed discharges of dredged or fill material into "waters of the United States" require Corps of Engineers authorization under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344). "Waters of the United States" include, but are not limited to, coastal and inland waters, lakes, rivers and streams that are navigable waters of the United States, including adjacent wetlands; tributaries to "navigable waters of the United States," including adjacent wetlands; interstate waters and their tributaries, including adjacent wetlands; and all other waters of the United States.

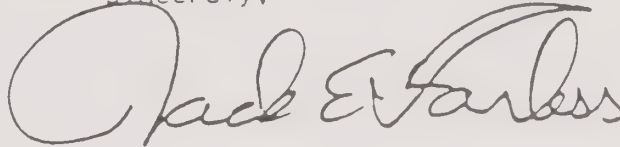
On the enclosed topographic drawing, we have delineated the Section 404 areas in red. Of the total 402 acre site, 23.62 acres (indicated in red) would require a Section 404 permit. Application for Corps authorization should be made to this office using the application form in the enclosed pamphlet. The application must include plans showing the location, extent and character of the proposed work and/or structure, prepared in accordance with the requirements contained in this pamphlet. You should note, in planning your work, that upon receipt of a properly completed application and plans, we are required to advertise the proposed work by issuing a public notice for a period of 30 days.

Please note that based on recent revisions to the Corps of Engineers regulations (33 CFR 320.4(a)(1)), it will be necessary for you to demonstrate to the Corps that your proposed fill is necessary because there are no practicable alternatives, as outlined in the U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines. A copy is enclosed to aid you in preparation of this alternative analysis. Be aware that failure to satisfy the 404(b)(1) Guidelines will require denial of your application for a Corps permit.



If you have any questions, please call Mr. Darwin Helmuth of our Regulatory Functions Branch (telephone 415-974-0418). Please address correspondence to the District Engineer, Attention: Regulatory Functions Branch, and refer to the file number at the head of this letter.

Sincerely,

A handwritten signature in dark ink, reading "Jack E. Farless". The signature is fluid and cursive, with a large initial "J" and "F".

Jack E. Farless  
Chief, Construction-Operations  
Division

Enclosures

Copy furnished w/encl

US F&WS, Sacramento, CA  
US EPA, S.F., CA  
US NOAA, Tiburon, CA  
CA F&G, Yountville, CA  
CA RWQCB, Oakland, CA  
Leslie Carmichael, Novato, CA

APPENDIX B

HAMILTON FIELD WETLANDS MITIGATION PLAN

# WETLANDS MITIGATION

December 4, 1985  
Revised April 1, 1987  
Revised September 1, 1987

## HAMILTON FIELD

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BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

## WETLANDS MITIGATION PLAN

### HAMILTON FIELD

#### INTRODUCTION

This wetlands mitigation plan is the result of numerous meetings with California State Fish and Game, Federal Fish and Wildlife, Audubon and responses to the Draft EIR. We have responded to these agencies by retaining almost all of the existing riparian habitat and including uplands grasslands within our mitigation areas. We have also increased our buffer areas and included a fence to protect the wetlands. Our goal is to have no net loss of wetlands and an increase in habitat value.

The northwest corner of the Hamilton Field property around Ammo Hill contains a mosaic of upland and wetland vegetation types. The wetlands vegetation has been described and mapped in a separate report (LSA, 1985) which is on file with the City of Novato. The LSA report identified three wetland vegetation types present within this area. There is a willow (riparian woodland) as well as two herbaceous wetland types, cattail marsh and a grass/forb association which forms a seasonal wetland. An area of 23.4 acres was mapped as being covered by these wetland types.

After completion of the LSA report, the Corps of Engineers was requested to conduct a Jurisdictional Determination of the property which was completed in February, 1986. The Corps asserted Section 404 jurisdiction over 23.62 acres of the property. This corresponded very closely to the areas mapped as wetlands by LSA. The areas of Corps jurisdiction are shown on Map A. This area includes both woody riparian and herbaceous wetland vegetation.

Development of the Hamilton Field project will result in the filling and development of several isolated wetland areas on the property over which the Corps has asserted jurisdiction over. This plan presents the proposed mitigation for the loss of these wetlands. It is separated into two major sections, a seasonal wetlands establishment plan and a riparian establishment plan. Implementation of this wetlands mitigation plan will result in no net loss of wetland vegetation and an increase in habitat value.

## SEASONAL WETLANDS MITIGATION PLAN

### Introduction

This section presents recommendations regarding the expansion of seasonal wetland acreage in the northwest and northeast portions of the Hamilton Field project site to compensate for the loss of similar wetland vegetation in the development area. Field investigations included mapping and inventorying wetland areas on the project site and visiting wetland areas on the adjacent Humane Society marsh property and the Ignacio flood control pond to become familiar with wetland conditions in the project area.

### Existing Conditions

Herbaceous wetland vegetation is present on the Hamilton Field site around Ammo Hill and the east end of the main Ammunition Storage Bunker (Map B). These wetlands consist of grass/forb seasonal wetlands to the south and west of Ammo Hill and contain a variety of herbaceous species including sedge (*Carex* sp.), rush (*Juncus* sp.), pennyroyal (*Mentha pulegium*), cocklebur (*Xanthium canadensis* var. *strumarium*), semaphore grass (*Pleuropogon californicus*), salt grass (*Distichlis spicata*), curly dock (*Rumex crispus*), and rabbitsfoot grass (*Polypogon monspeliensis*). The grass/forb seasonal wetlands are present in areas of saturated soil or where standing water shallowly ponds for short periods in the winter. They also include cattail marsh growing in the channels and ditches surrounding the east end of the main ammunition storage bunker and the drainage channel which extends from this bunker to the southeast side of Ammo Hill. Cattail (*Typha latifolia*) is the dominant species in this type.

### Hamilton Field Master Plan

The Hamilton Field Master Plan proposes to fill and develop several isolated herbaceous wetland areas located primarily to the south and southwest of Ammo Hill and at the east end of the main ammunition storage bunker. To compensate for the loss of herbaceous wetland habitat the Master Plan proposes to create additional seasonal wetland habitat in the lowlying area to the northwest and east of Ammo Hill and in the area between the Northwestern Pacific Railroad right-of-way and the willow stand along Pacheco Creek (Map C). The proposed project will result in the loss of 5.73 acres of wetland. The implementation of the Master Plan will result in the creation of 6.04 acres of a new seasonal wetland, resulting in a net increase of .31 acres of wetland habitat and an increase in habitat value.

The proposed wetland restoration area east of Ammo Hill contains seasonal wetland and upland grassland. The existing wetland in this area, which covers 1.70 acres (Corps Jurisdiction #17, Map A), contains a variety of species including alkali heath (*Frankenia grandifolia*), salt grass (*Distichlis spicata*), fat hen (*Atriplex patula*), curly dock (*Rumex crispus*), cattail (*Typha latifolia*), rabbitsfoot grass (*Polypogon monspeliensis*), and brass button (*Cotula coronopifolia*). This is an historic wetland area mapped by Nichols and Wright (1971) as being part of the salt marshes which fringed San Francisco Bay. The soils at this location are a combination of seasonally flooded bay mud, bay mud which supports annual grassland and fill overlying bay mud. The annual grassland surrounding and intermixed with the wetland contains ryegrass (*Lolium* sp.), wild oat (*Avena*



sp.), and red fescue (Festuca rubra). The entire area is mowed at the end of the growing season to improve visibility around the over-run and taxi areas.

Another proposed wetland restoration area northwest of Ammo Hill contain a combination of seasonal wetlands, upland grassland and riparian vegetation. This area is adjacent to Pacheco Creek and The Humane Society Marsh. The upland portions of this area contain grassland that is dominated by beardless wild rye (Elymus triticoides), common velvet grass (Holcus lanatus), barley (Hordeum spp.) and wild oats (Avena spp.). Intermixed within both of these areas are patches of arroyo willow (Salix lasiolepis) and yellow willow (Salix lasiandra).

The third proposed seasonal wetland area is between the main Riparian area and the railroad right-of-way. This area is composed of scattered riparian trees and upland grasses.

Wildlife use of existing seasonal wetlands on the site is restricted due to their small size and sporadic period of flooding. Wetland wildlife use primarily occurs during the late winter and early spring when enough rain has fallen to saturate the soil and shallowly pond on the surface. The length of time water is present varies depending on the timing and amount of rain which falls in any given year. This area was dry by the end of April, 1986, a year of heavy late season rains and by the end of March, 1987, a year of lower than normal rainfall.

Wildlife species observed using the existing seasonal wetlands include a great egret, snowy egret, a great blue heron, mallard, cinnamon teal, killdeer and raccoon. Areas of ponded water support bullfrog, pacific tree frog, and one ponded area to be preserved had a western pond turtle.

#### Wetland Vegetation Restoration

The Master Plan proposes to establish three areas of seasonal wetlands in the wetlands mitigation areas (Map C). The intent of this plan is to convert areas of upland grassland which are adjacent to existing wetlands to seasonal wetland. This will increase the habitat value of on-site wetlands by consolidating the wetland acreage into three large areas rather than a number of smaller, separate marshes as currently exist. This will also increase wetland habitat diversity in the project area. The adjacent Humane Society marsh is primarily woody swamp and the Ignacio flood control pond is primarily open water or cattail-tule marsh. There is very little seasonal wetland habitat associated with either. The establishment of three larger areas of seasonal wetlands will allow wildlife which use a combination of wetland habitat types to use this area to a greater extent.

The following actions will be incorporated into the seasonal wetland establishment and management program:

##### A. Site Preparation

The largest mitigation area is on the northeast side of Ammo Hill. This area will be converted to seasonal wetland. Significant acreage to the north and east of this mitigation area will remain in upland grasses. The wetland restoration areas on the west and northwest sides of Ammo Hill and next to the railroad right-of-way will contain a



mixture of wetland and retained upland grassland.

The areas of grassland to be converted to seasonal wetlands will be graded down to the elevation of the existing wetlands in their immediate vicinity. The ground surface of the wetland will be left uneven and at elevations varying up to six inches to a foot to increase diversity in water depth and plant establishment and insure retention of water.

B. Marsh Buffer

The restoration area to the northeast of Ammo Hill is located to maximize the use of existing buffers. The east side of the restoration areas borders the northwest over-run area and taxiways. The north side is adjacent to existing dike and wetland and project open space. The south side is bordered by a road and the southwest side is adjacent to the light industrial area. A 4 foot high chain link perimeter fence will be constructed to prevent direct access into the marsh.

The restoration area between the railroad right-of-way and the riparian woodland will also maximize the use of existing buffers. The railroad right-of-way will form the western boundary, the drainage channel on the property line will form its north boundary, to the south the new main entrance road will act as a buffer and the eastern edge is the existing Pacheco creek Channel and the large stand of willow trees.

The restoration area on the northwest side of Ammo Hill will be adjacent to existing wetland or project open space on its north, west, and east sides, and a portion of its south side. The south side of the Seasonal wetland areas will have a buffer of upland grassland varying from 10 to 30 feet. There will also be an elevation difference of approximately 4 feet to the top of the bank separating development from the grasslands and wetlands. At the top of the bank will be a pedestrian pathway with further setbacks to buildings planted with native plants. A 4 foot high chain link fence will be placed along the edge of all wetland habitat. The fence will be planted with species such as California Rose and Himalaya Berry which are presently found on site.

C. Setback

In the area Northwest of the setback dimension will vary from 10-30 feet. The total of buffer and setback will vary from 20 to 50 feet. The setback area will contain an 8 foot paved pathway. The paved path will be at an elevation of  $10 \pm$  feet, which will be higher than the adjacent developed areas and wetlands. This height will create a berm resulting in increased separation from the wetlands. The paved path will be accessible for public use as part of the overall project network of bike paths and pedestrian trails.

Buildings will be designed to reduce impact on nearby wetland areas and to generate a desirable visual relationship between built features and the habitat area. Multifamily residential units will have patios or porches which face on the wetland and will be separated from them by the pathway and native landscaping. Landscape maintenance will be the responsibility of the building owners or the property owners association.

D. Water Management

Ponded water is present in the existing seasonal marsh after sufficient rain has fallen to saturate the soil and pond on the surface. The length and time of year when water is present varies from year to year. To establish the restoration areas, they will be flooded on or about November 15 to a maximum depth of 4-6 inches. After initial flooding, rainfall and runoff will be relied on to provide additional water.

The existing seasonal marsh and mitigation areas to the northeast of Ammo hill have a drainage area of approximately 15 acres which would collect approximately 30 acre feet of water during the rainy season (assume a minimum of 24" annual rainfall). The existing marsh and mitigation area would require approximately 3 acre feet of water to create surface water depths of 4" to 6". The mitigation area soil type is bay mud which tends to increase the length of time that water will pond. Assuming a 4 month rainy season, there will be more water than needed to maintain the wetlands mitigation area planned. The length of time ponded water is present will be managed to allow for the establishment of the herbaceous wetland species currently present.

E. Revegetation

All graded surfaces within the marsh restoration areas will be revegetated with a mix of plant species found in the existing seasonal wetland. Seed will be collected from the project site or nearby areas and will be distributed over the marsh surface and incorporated into the surface soil prior to flooding. The following species will be included in the seed mix: fat hen, curly dock, rabbitsfoot grass, brass buttons, pennyroyal mint, cocklebur, and alkalai heath.

B-R/1674

## RIPARIAN VEGETATION ESTABLISHMENT PLAN

### Introduction

This section presents the plan for the establishment of riparian vegetation along the proposed new channel of Pacheco Creek and the west bank of the existing Pacheco Creek channel. Field investigations included surveys of project site riparian areas and off-site along the lower reaches of San Jose Creek east of Highway 101 to become familiar with project area riparian conditions.

### Existing Conditions

Riparian vegetation is present on the Hamilton Field site along the banks of Pacheco Creek downstream from the end of the concrete lined channel and in the area lying between the west side of Ammo Hill and the creek channel (Map B). Yellow willow (Salix lasiandra) and arroyo willow (Salix lasiolepis) are the dominant tree species in the type and form the majority of the tree cover. Other tree species found within the riparian woodland include an introduced weeping willow (Salix sp.), box elder (Acer negundo ssp. californicum), and what appears to be a single individual of an introduced walnut (Juglans sp.). The riparian woodland along this reach of Pacheco Creek is recently established, beginning to appear on aerial photographs in the early 1950's. The young age of the stand probably accounts for the low diversity in tree species composition. Understory vegetation beneath the canopy of the trees is composed primarily of annual herbaceous species. Woody vegetation is present in some areas along the margin of the woodland. Shrub species diversity is low with California rose (Rosa californica) and the introduced Himalaya berry (Rubus procerus) being the only species present.

The adjacent off-site lower reaches of San Jose Creek in comparison supports a greater diversity of riparian tree species. The two willows grow with white alder (Alnus rhombifolia), Oregon ash (Fraxinus latifolia), and box elder. Valley oak (Quercus lobata) and coast live oak (Quercus agrifolia) grow on the creek's upper banks. San Jose Creek also supports a greater diversity of understory shrubs. In addition to the blackberry and rose, other species present include snowberry (Symphoricarpos albus), and California blackberry (Rubus vitifolius). A list of woody riparian species found along Pacheco and San Jose creeks is presented in Table 1.

### Hamilton Field Master Plan

The construction of the main entrance road will result in the removal of riparian vegetation. This will be replaced by the planting along the new Pacheco Creek channel and by widening the riparian zone along the west side of the existing Pacheco Creek channel.

The proposed project will result in the loss of 1.46 acres of woody riparian vegetation. The implementation of this plan will result in the creation of 1.58 acres of new riparian woodland, resulting in a net increase of riparian habitat of .12 acres and an increase in habitat value.



## Site Preparation and Buffer

The riparian mitigation area is adjacent to the existing riparian area and contains scattered riparian vegetation. The elevation of the existing uplands grass area is the same as the elevation of the existing riparian vegetation. The riparian vegetation will be planted in conjunction with seasonal wetlands and retention of existing uplands grasses thereby creating a large buffer area.

## Buffer and Setback

The buffer west of the riparian mitigation will be comprised of the uplands grasslands retained and the railroad right-of-way. The setback on the east side of the mitigation area will be large due to the existing riparian habitat east of the mitigation area.

The buffer on the east side of the existing riparian habitat will be 10 to 30 feet depending on the undulating line of habitat juxtaposed with the straighter line of a pedestrian path.

The setback from the buffer will be 10-30 feet to building including the pedestrian path and native plantings. Total setback from riparian habitat to buildings will be 20-50 feet.

## Riparian Vegetation Restoration and Water Management

Our plan will result in a riparian zone which contains a greater diversity of native tree and shrub species than currently found along the Pacheco Creek riparian zone by introducing other native species found along the lower reaches of San Jose Creek. The goal is to establish a fully developed riparian zone with a canopy of trees which shade the stream, increasing its biologic value and reducing necessary flood control maintenance. Biologic values will be increased by developing a riparian woodland which contains a diversity of tree and shrub species within the woodland, creating greater structural diversity by planting in the tree, shrub, and herbaceous plant layers, and by establishing plants that will create a closed canopy over the stream shading it and cooling water temperatures. All of these factors result in greater wildlife use of the riparian zone.

Flood control maintenance requirements for vegetation clearing will be reduced by establishing tree species which can quickly grow and create a canopy over the stream channel, shading out plant species which grow within the channel. This approach will require periodic maintenance in the short-term (10-15 years) to clear cattail and arroyo willow from the channel. As the canopy of trees closes over the stream the cattail and arroyo willow will be shaded out, reducing the need to clear vegetation from the channel bottom. The closed tree canopy will also result in less algae growth in the stream channel.

The following principles will be incorporated into the creek design:

- A. The creek will be designed to have a low flow channel which is free of woody vegetation. Adjacent to the low flow channel will be a flat or gently sloping base flow channel. Beyond the base flow channel the

banks will extend evenly at 3:1 slopes to the top of the bank. The channel will be sufficiently wide to allow maintenance equipment to clear sediments and plant growth from within the channel.

- B. The most successful natural growth will take place on the banks adjacent to the base flow channel. Depending on the species used, supplemental irrigation for a period of one to two years may be necessary on the upper banks.
- C. The riparian trees suitable for use (Table 1) grow at different rates. As a general rule, fast growing species are short-lived and slow growing species are long-lived. The planting will reflect this by using a combination of slow and fast growing species. Fast growing species (yellow willow, white alder) will provide rapid plant establishment. As the faster growing species decline in vigor and perhaps die, the slower growing species (Oregon ash, valley oak) will be replacing them in the tree canopy, providing for long-term vegetative cover.
- D. A well developed riparian community exhibits zonation of the plants, with species requiring the greatest amount of water generally found closest to the water (willows) and those species requiring less water growing further up the banks (oaks). The planting design will reflect this zonation of species.
- E. Shrub species found in riparian areas grow beneath the canopy of the trees. Conditions for their successful establishment will not exist at the time of initial planting. Their planting will be delayed until a tree canopy has become established. Soils will be protected during this period by establishing a cover of herbaceous plants. For example, beardless wild rye from on-site sources can be used to establish the herbaceous plant cover.
- F. The creek banks will be an unlined earth channel to allow the establishment of plant cover. Rip-rapping or other similar methods of channel protection will only be used where bank erosion is likely.

B-R/1675

### Realignment of Pacheco Creek:

Solving regional transportation problems with the least environmental impact will be dependent on the successful development of the regional transportation plans for the N.W.P. right-of-way. A primary planning premise of the Hamilton Field project is to design the project to enhance public transit on the N.W.P. right-of-way and thereby reduce traffic impacts which will in turn reduce environmental impacts.

The design solution for the transit corridor through Hamilton Field requires grade separated crossings at the New Main Entrance Road and at State Access Road. The only way to obtain grade separation is to depress the transitway. The lowered transitway will block the current flow of Pacheco Creek water under the existing railroad tracks. In that water now flows from concrete culverts into a concrete lined channel, changing the route of flow will not affect a natural habitat area and is not under the jurisdiction of the Corps of Engineers.

Due to the need to depress the public transit right-of-way, the Pacheco Creek flow must remain on the west side of the railroad right of way. The earliest possible crossing to the east side is approximately 200' from the north property line. Because of the character of the flow line, i.e., depth of the channel from finish grade to the water level, which will be from 10' to 12' below the grade of adjacent new improvements, it is not possible to use the creek as a visual benefit to the project or as a viable wildlife habitat. The development west of the railroad right of way will include a major transit station and related commercial development, well above the required elevation of the creek. See Figure "E".

The integration of a water course with the urban development, particularly one sized to handle the 100 year storm flow requirement, would not be possible. The preferred solution is to underground the flow into a pipe culvert until it exits at grade into the wetlands area near the north property line.

The underground section is a replacement for the concrete lined ditch which now exists east of the railroad right of way. Thus, habitat value is not lost by the proposed solution. The length of the creek above grade, in the wetlands area, is approximately the same length as the distance from the new entrance road to the north property line. The existing channel from the New Main Entrance Road and the new creek channel will be left in place resulting in a greater length of creek channel. The riparian area is not decreased by the use of the underground pipe culvert system.

### Impact of Realignment of Pacheco Creek

The wetlands mitigation will include a realignment of a portion of Pacheco Creek in the riparian habitat area east of the Northwestern Pacific Railroad right-of-way, near the north edge of Hamilton Field. Portions of Pacheco Creek in non-wetlands areas will be underground in concrete culverts.

The existing portion of Pacheco Creek which flows in the concrete lined channel is not within the jurisdictional area determined by the Army Corps of Engineers. The concrete lined channel is maintained to maximize its ability to carry stormflows. Maintenance consists of removal of any plant growth and deposits of sediments within the channel. There is no habitat value due to

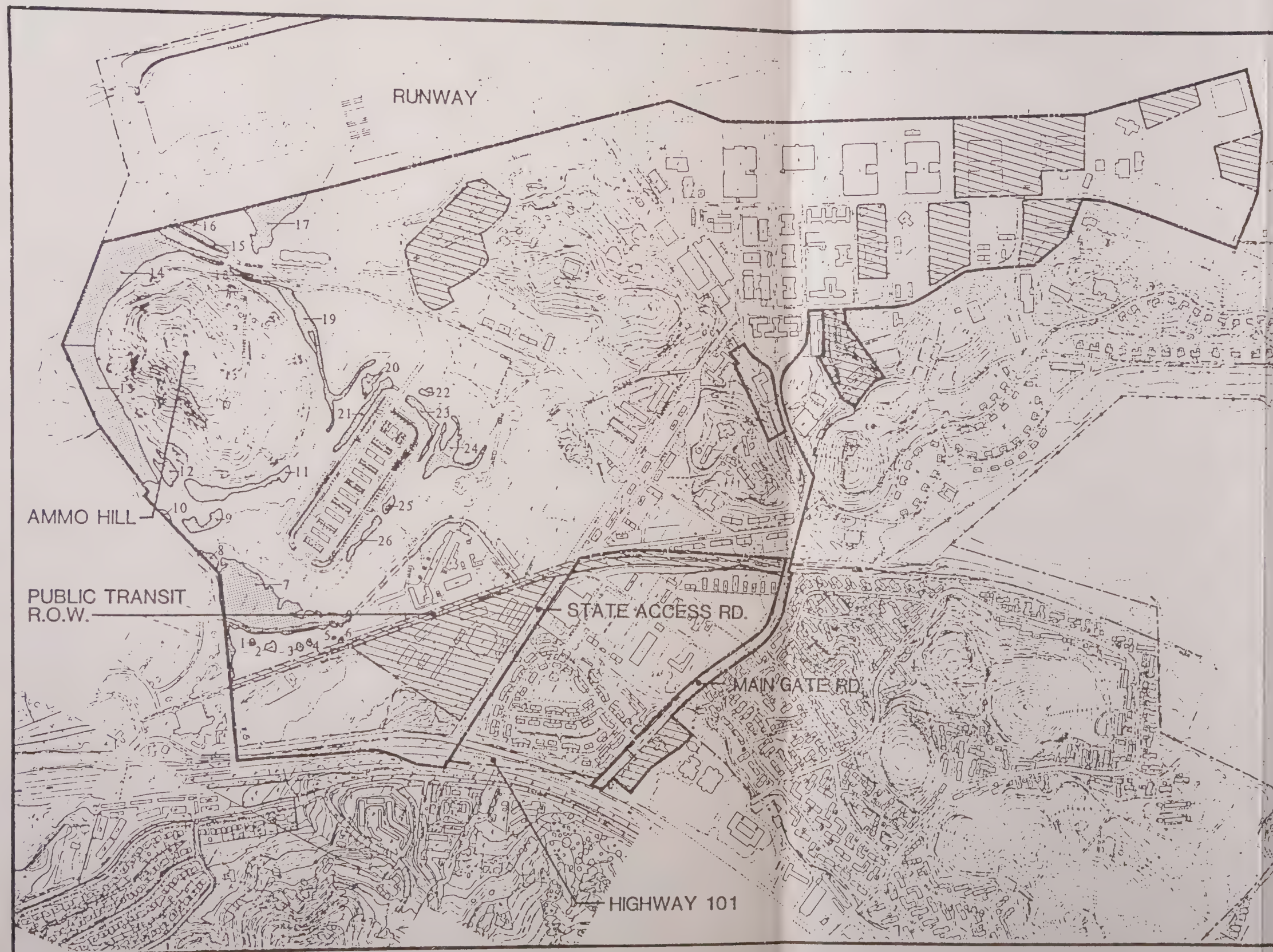


this routine maintenance. The effect of this maintenance works to remove whatever plant growth is present before it becomes wildlife habitat.

The realignment of Pacheco Creek will result in the relocation of the concrete lined portion of the main creek channel into an underground culvert located east of the railroad R.O.W. The existing earth lined channel downstream from the concrete lined channel will partially remain in an undisturbed condition. The willow trees, blackberry thickets and other riparian vegetation which grow along the channel banks established because of the saturated surface soil condition and are now deeply rooted, drawing water from the groundwater table. The water table is maintained by the impoundment of water in the Flood Control Pond, rainfall, and inflow from the creek. All of these sources of water will be maintained as currently found or will be sufficiently close to the old channel that the existing riparian vegetation will have sufficient water to maintain normal growth.

B-R/1676





# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

December 4, 1985  
Revised April 1, 1987  
Revised September 1, 1987

 Section 404 Jurisdiction

## Site Inventory (approx. acreage)

1.	.064	14.	5.168
2.	.11	15.	.36
3.	.046	16.	.018
4.	.032	17.	1.70
5.	.018	18.	.11
6.	.038	19.	1.48
7.	5.40	20.	.34
8.	.172	21.	.64
9.	.44	22.	.09
10.	.064	23.	.45
11.	1.13	24.	1.10
12.	.42	25.	.11
13.	3.80	26.	.32

TOTAL 23.62

## AREAS OF CORPS JURISDICTION

0 200 400 800



**A**





# HAMILTON FIELD MASTER PLAN

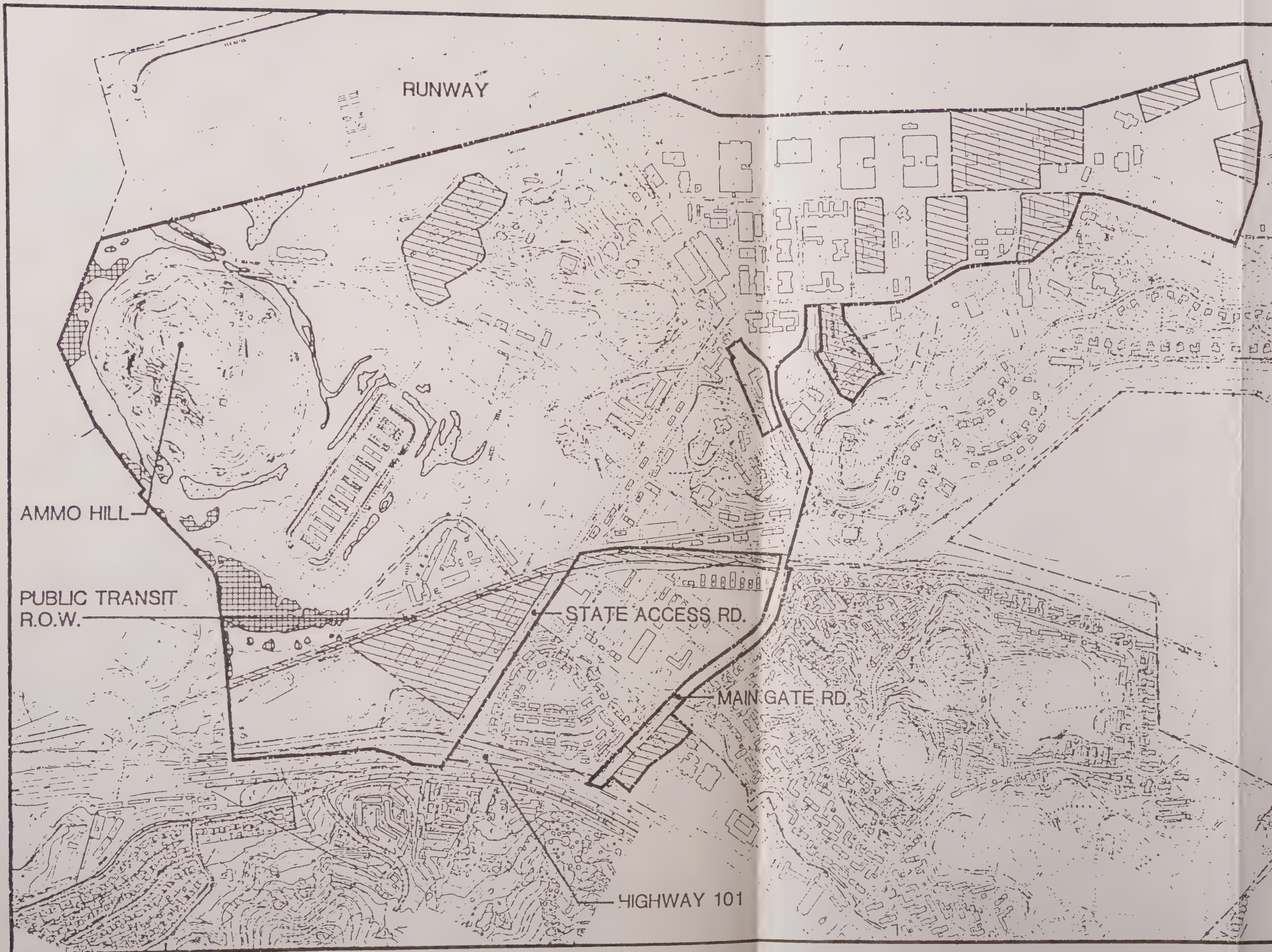
BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

December 4, 1985  
Revised April 1, 1987  
Revised September 1, 1987

-  Seasonal Wetland Species
-  Cattail and Seasonal Wetland Species
-  Willows

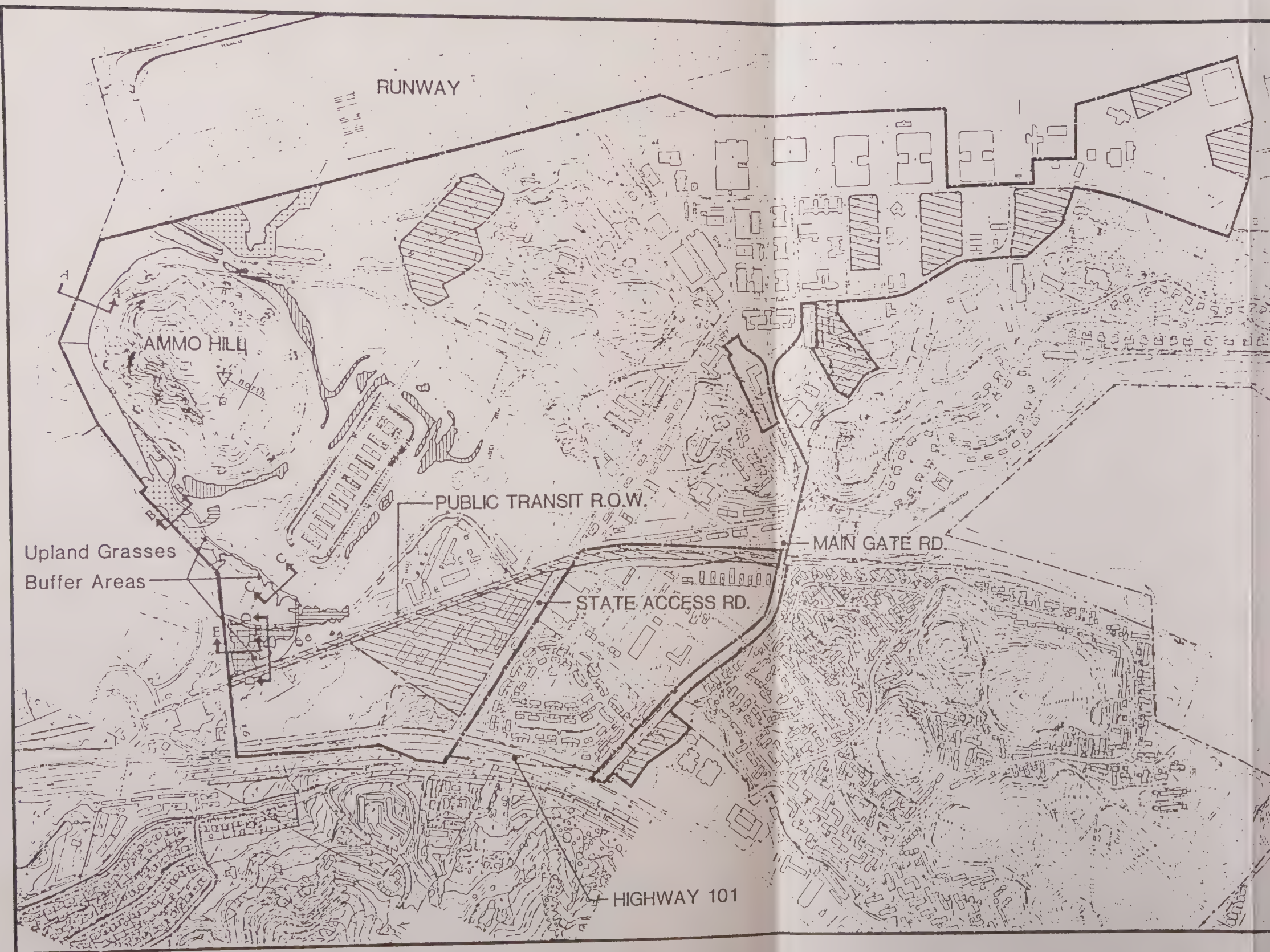
## WETLAND VEGETATION TYPES

0 200 400 800









# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

December 4, 1985  
Revised April 1, 1987  
Revised September 1, 1987

Total Acreage Regulated by  
Section 404 Jurisdiction 23.62 ac.

Wetlands Preserved 16.43 ac.

Cattail and Seasonal  
Wetlands Lost 5.73 ac.

Riparian Wetlands  
Lost 1.46 ac.

Total Wetlands Lost 7.19 ac.

Seasonal Wetlands  
Mitigation 6.04 ac.

Riparian Wetlands  
Mitigation 1.58 ac.

Total Wetlands Mitigation 7.62 ac.

Net Wetlands Gain .43 ac.

Military Property Under  
Negotiation

A A Representative Section  
(See Text)

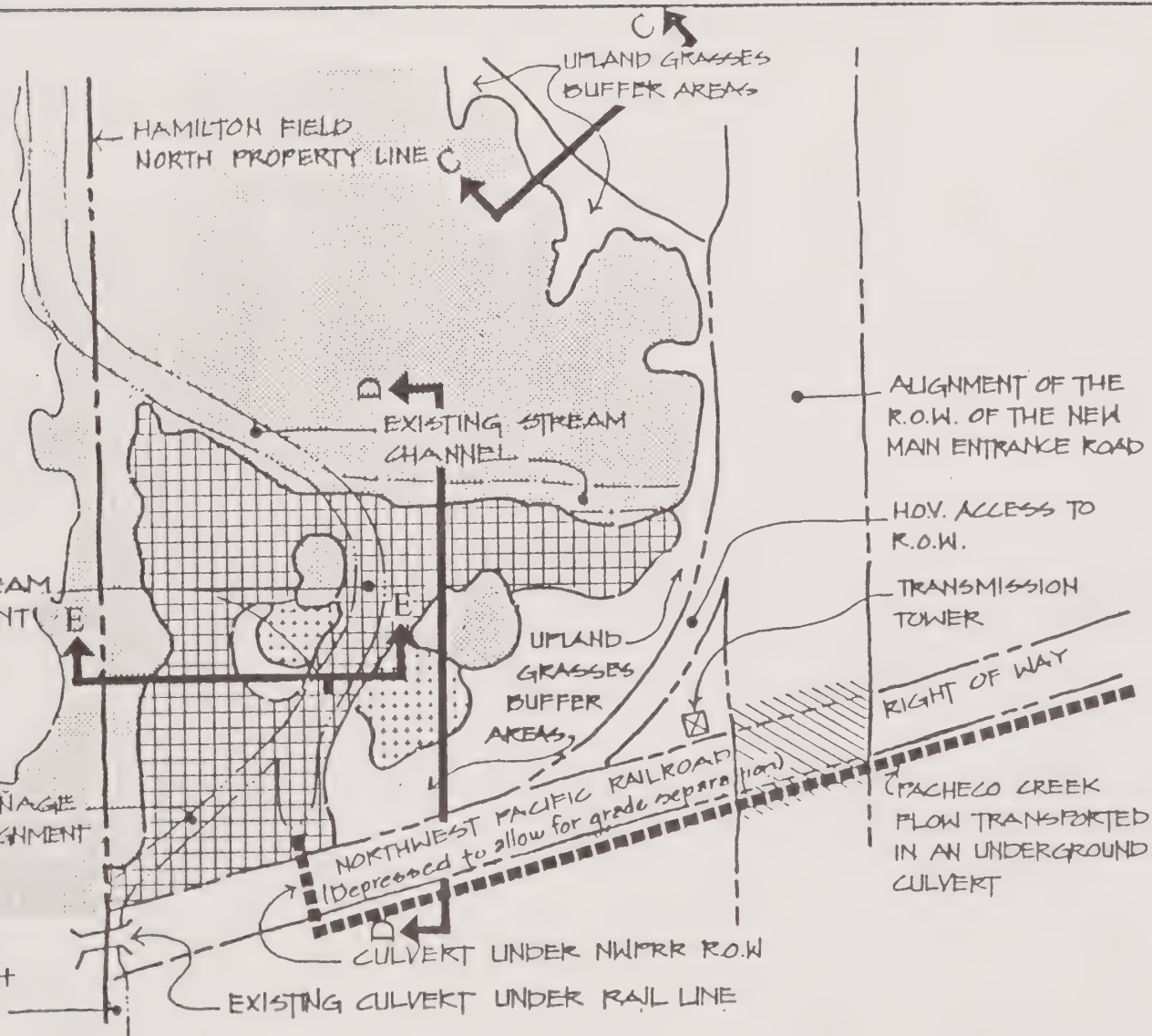
## WETLANDS MITIGATION PLAN

0 200 400 800









## HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

September 1, 1987

- Section 404 Jurisdiction  
to Remain
- Riparian Mitigation
- Seasonal Wetland  
Mitigation
- Representative Section  
(See Text)

## PACHECO CREEK REALIGNMENT

NO SCALE



D

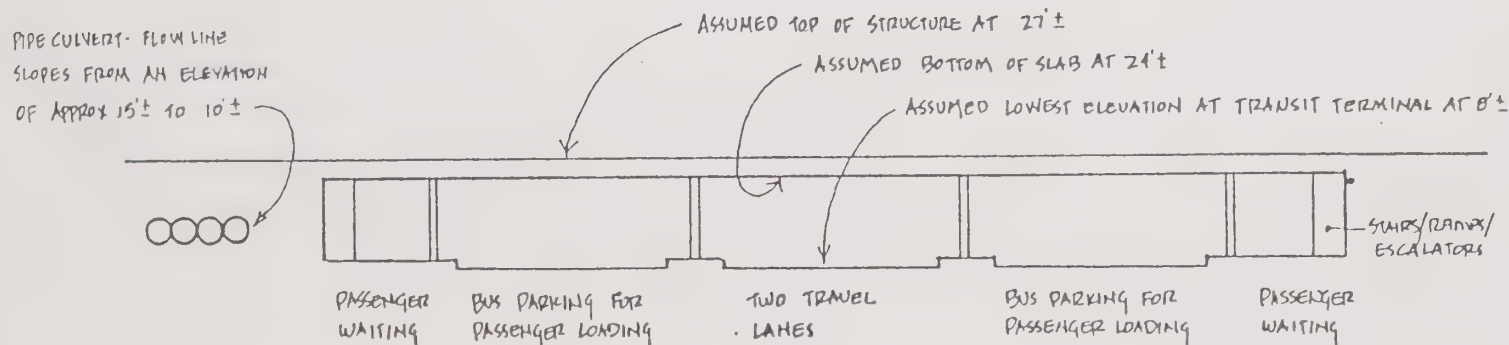




# HAMILTON FIELD MASTER PLAN

BERG-REVOIR CORPORATION  
FIVE HUNDRED PALM DRIVE  
NOVATO, CALIFORNIA 94947

September 1, 1987



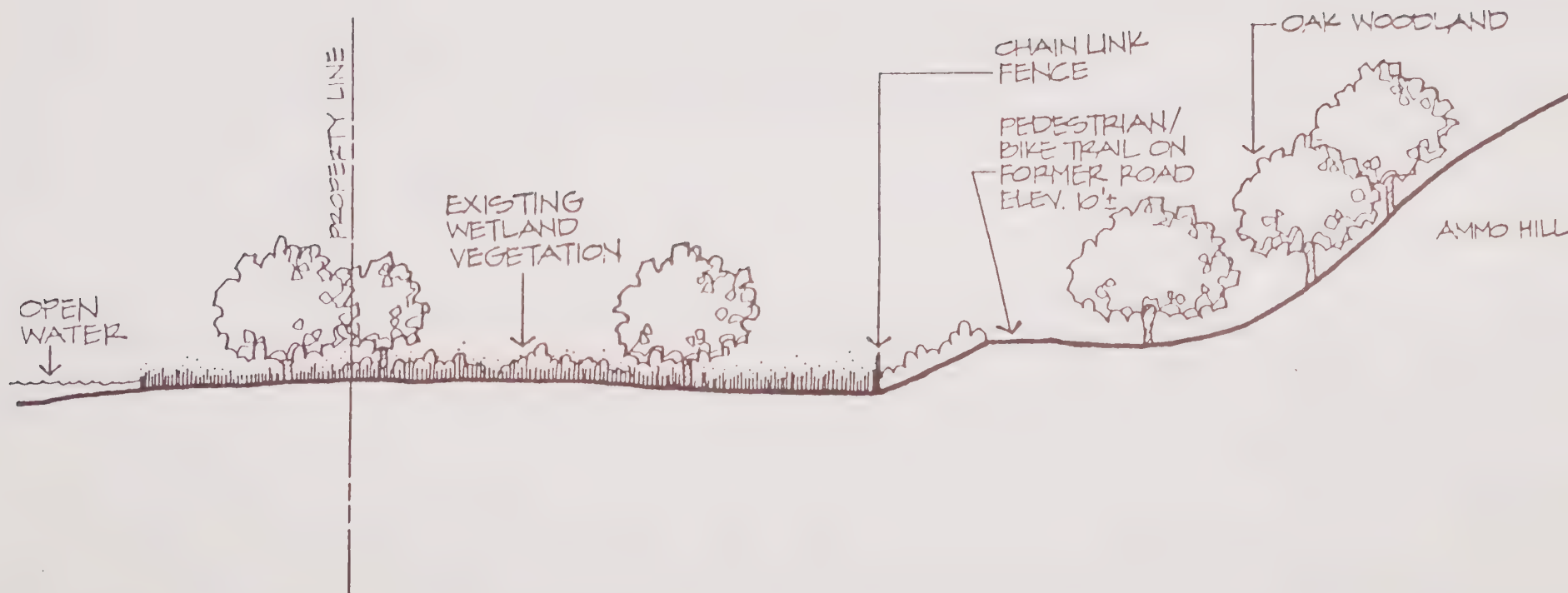
## RELATIONSHIP OF PACHECO CREEK CULVERTS TO PROBABLE TRANSIT STATION

(LIGHT RAIL VEHICLES WOULD ELIMINATE THE NEED FOR THE TWO BUS PARKING CORRIDORS, HOWEVER, THE CLEAR VERTICAL HEIGHT REQUIREMENT WOULD INCREASE BY APPROXIMATELY 4')

## PUBLIC TRANSIT STATION SECTION

NO SCALE

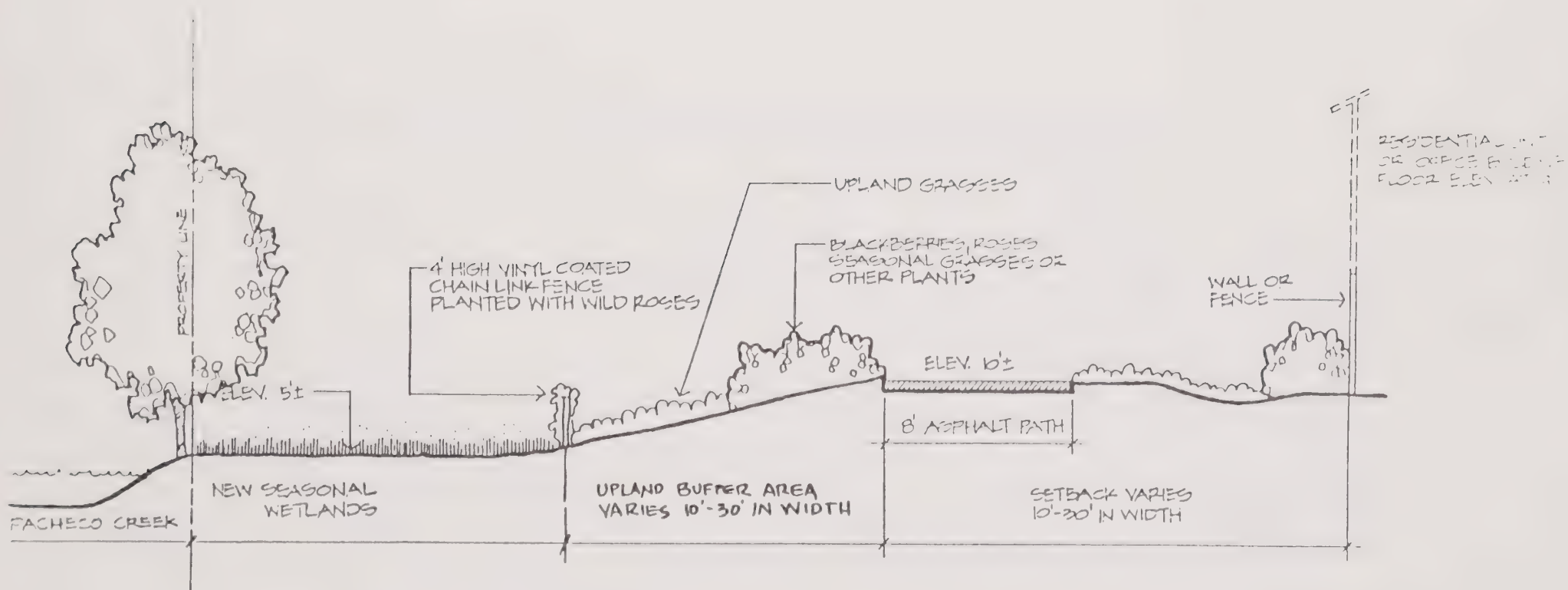
E



Section North Of Ammo Hill

Section A-A

December 4, 1985  
Revised April 1, 1987



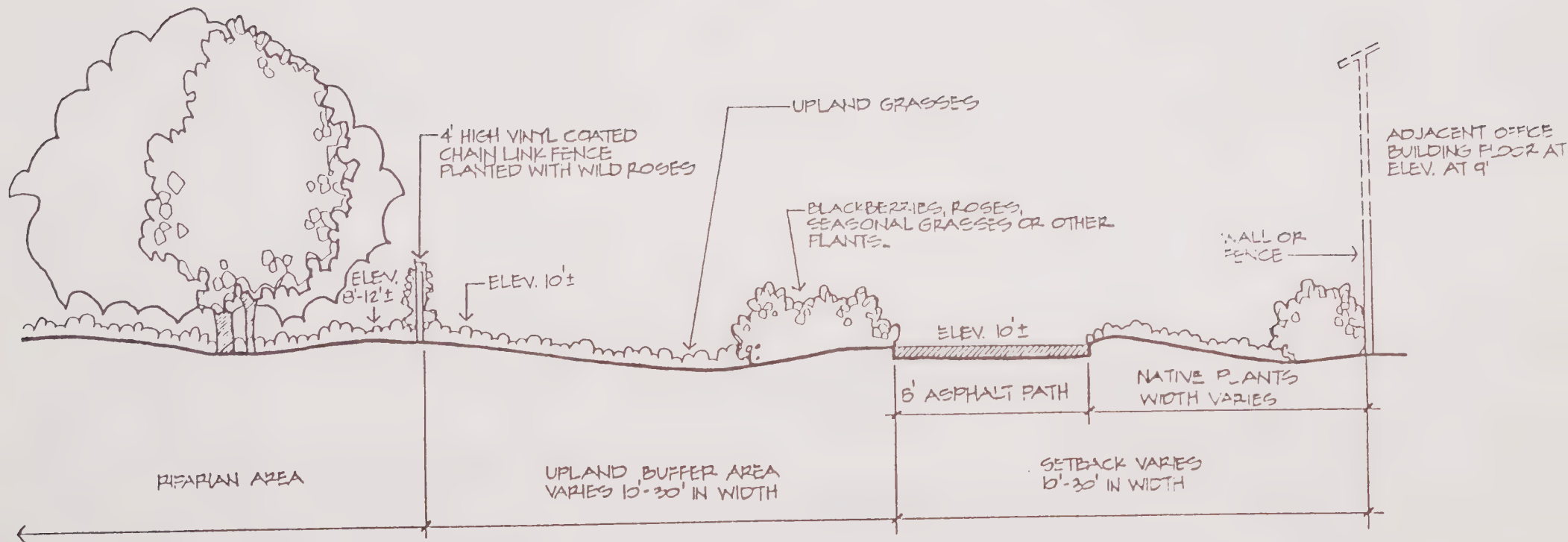
## Representative Seasonal Wetlands/Development Edge

### Section B-B

December 4, 1985

Revised April 1, 1987

Revised September 1, 1987



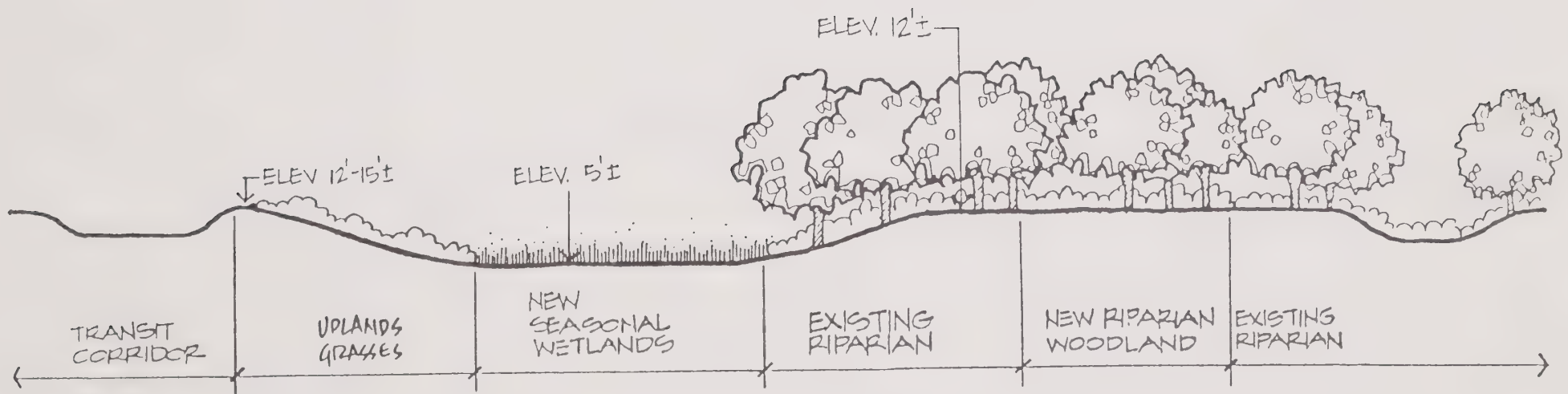
## Representative Riparian/Development Section

### Section C-C

December 4, 1985

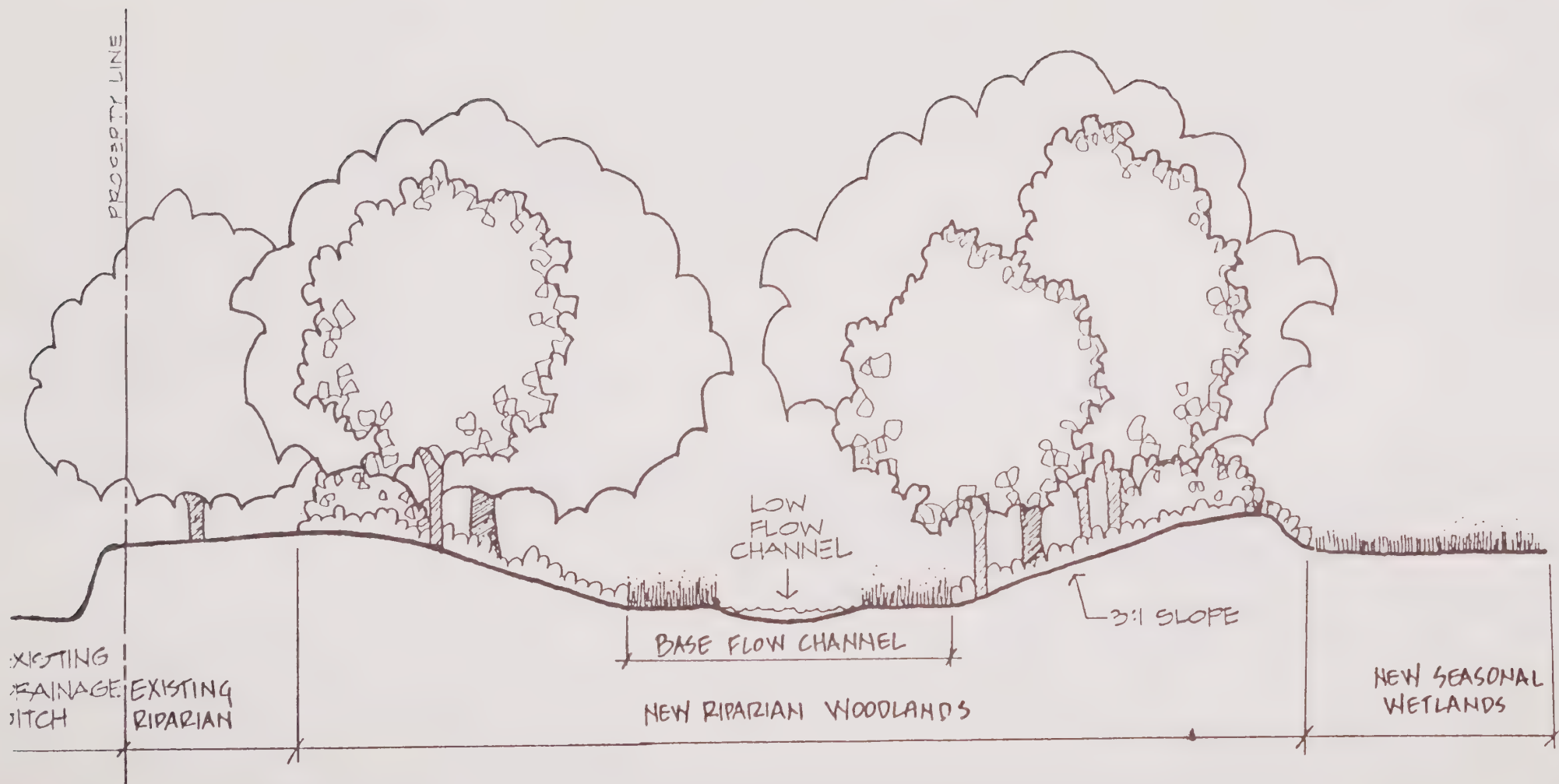
Revised April 1, 1987

Revised September 1, 1987



Representative Section  
Riparian / Seasonal Wetlands Transit Corridor





Representative Section New Pacheco Creek Channel

APPENDIX C

ALTERNATIVE SITES EVALUATION WORKSHEETS

# Alternative Sites Evaluation Worksheet

## Site 1 -- Silveira Ranch

**LOCATION:** Unincorporated Marin County, east of Highway 101, north of Smith Valley Road, south of St. Vincent's School. Northwestern Pacific Railroad tracks bisect middle of site.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** APN 155-010-27 is 244 acres, APN 155-010-64 is 87 acres, and APN 155-010-16 is less than 1 acre, owner is Joseph Silveira; APN 155-010-17 is less than one acre, owner is Mary Silveira; APN 155-010-70 is 119 acres, owner is Youth Activities of the Archdiocese of San Francisco, Inc. Total acreage of parcels about 450 acres.

**AVAILABILITY/STATUS:** Not available because property owners are proposing development on the site. Williamson's Act contracts expired on parcels 155-010-17, 155-010-27, and 155-010-64. Piombo Construction has a Use Permit for two acres of parcel 155-010-27 to use as a contractor's construction yard.

**POTENTIAL ENVIRONMENTAL ISSUES:** Loss of wetland areas and agricultural land. Eastern and southern portions of site potentially subject to flooding.

**EXISTING USES:** Undeveloped land, grazing, agriculture and one residence.

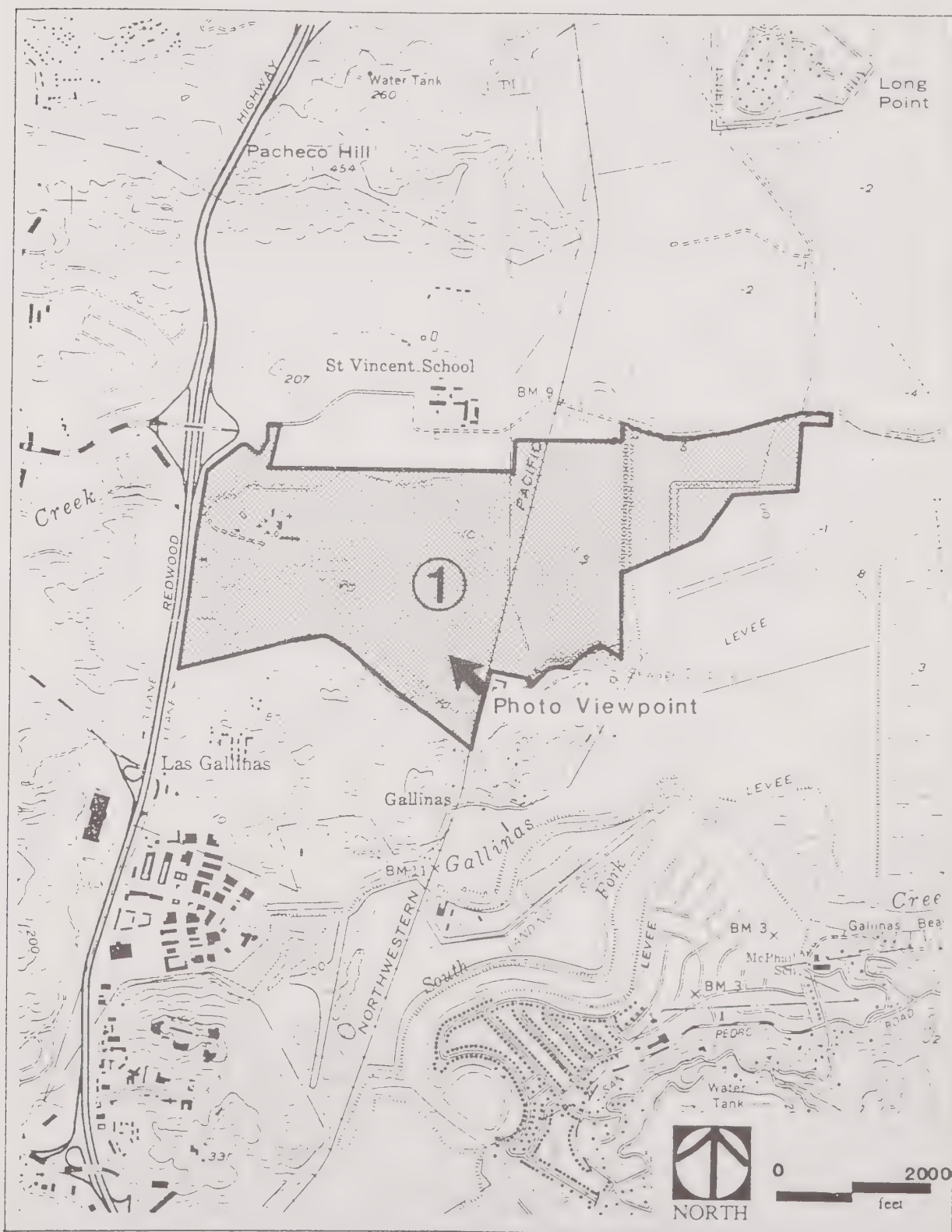
**ADJACENT USES:** St. Vincent's School to the north, low security detention center (County Honor Farm) to the south and Las Gallinas Valley Sanitary District reclamation project (wildlife marsh, storage ponds, saltwater marsh, and irrigated marsh) to the east.

**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Marin Countywide Plan land use is Agricultural. County Zoning is A-2, limited agricultural and rural residential.

View from County Honor Farm Looking Northwest



# Alternative Location - Site 1





# Alternative Sites Evaluation Worksheet

## Site 2 - St. Vincent's

**LOCATION:** In unincorporated Marin County, east of Highway 101, north of and adjacent to Site 1 (Silveira property), south of proposed site (Hamilton Air Force Base). Northwestern Pacific Railroad tracks bisect site.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** APN 155-010-44 is 320 acres and APN 155-010-69 is 129 acres, owner is Youth Activities of the Archdiocese of San Francisco, Inc.; APN 155-010-28 and 155-010-23 are less than one acre each, owner is Mary Silveira. Total acreage of parcels is about 449 acres.

**AVAILABILITY/STATUS:** Unavailable because property owners have future plans for the property. Williamson's Act contract expired on parcel number 155-010-69.

**POTENTIAL ENVIRONMENTAL ISSUES:** Eastern part of site subject to flooding. Northern part of site relatively steep and tree covered. Loss of wetland and agricultural land.

**EXISTING USES:** St. Vincent's School facilities and grounds located on site, agricultural and undeveloped.

**ADJACENT USES:** Silveira Ranch site adjacent to the south. Surrounding open space and agricultural uses.

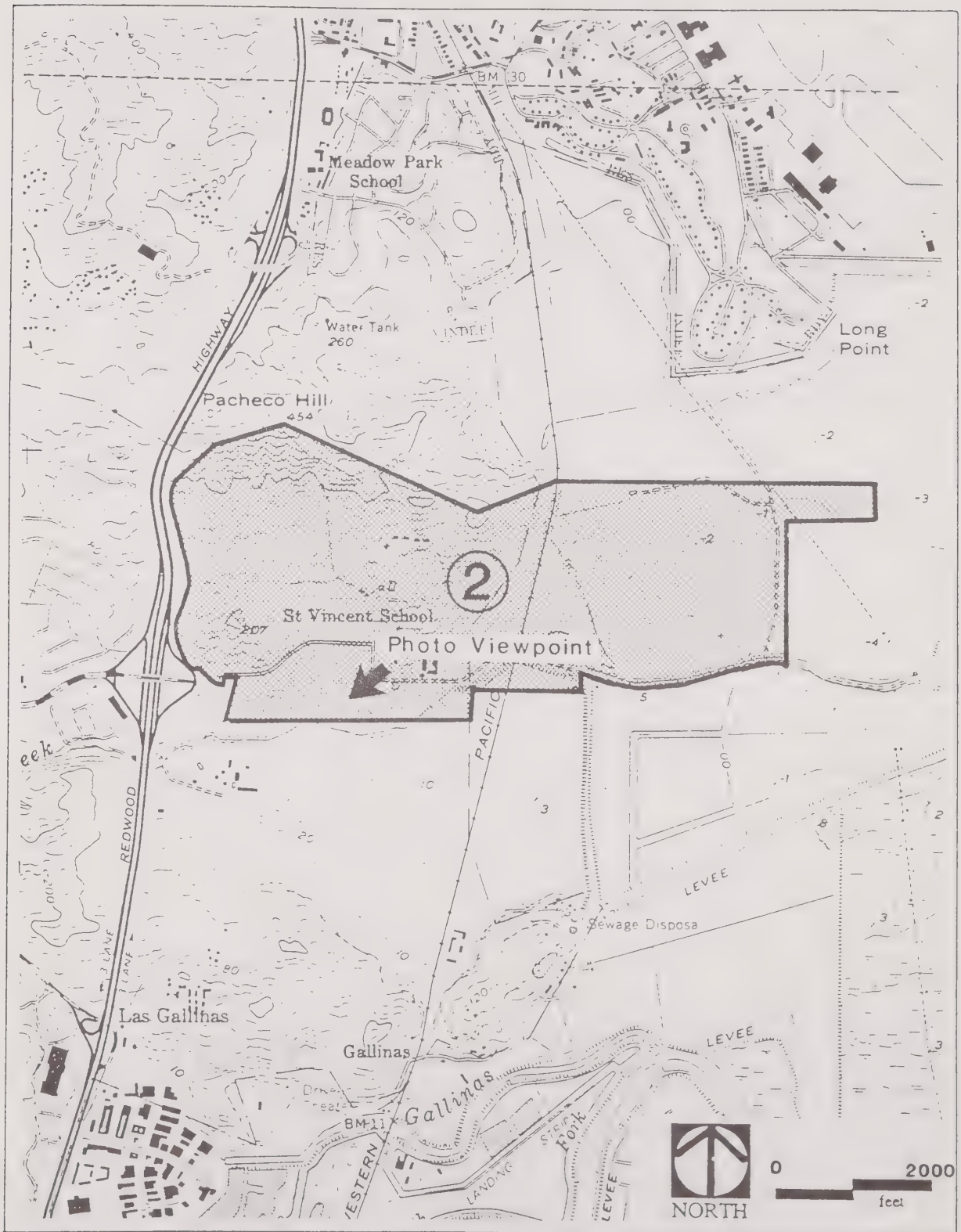
**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Marin Countywide General Plan Land Use is "developable area". Zoning is A-2, limited agricultural and rural residential.

View from St. Vincent's School Looking Southwest





## Alternative Location - Site 2



# Alternative Sites Evaluation Worksheet

## Site 3 - Deer Island

**LOCATION:** In City of Novato, east of Highway 101, north of Highway 37, south of Novato Creek, west of Northwestern Pacific Railroad tracks.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** 153-170-48 and eight parcels on AP map sheet 153-200 in various ownerships. Total acreage is 395 acres.

**AVAILABILITY/STATUS:** Of the total acreage, 240 acres are State-owned lands set aside for conservation under the California Land Conservation Act; a 106-acre site is pending approval for a shopping center development; and 20 acres are approved for single-family homes. 29 acres remain for potential development.

**POTENTIAL ENVIRONMENTAL ISSUES:** Potential flooding.

**EXISTING USES:** Undeveloped, cultivated field with drainages.

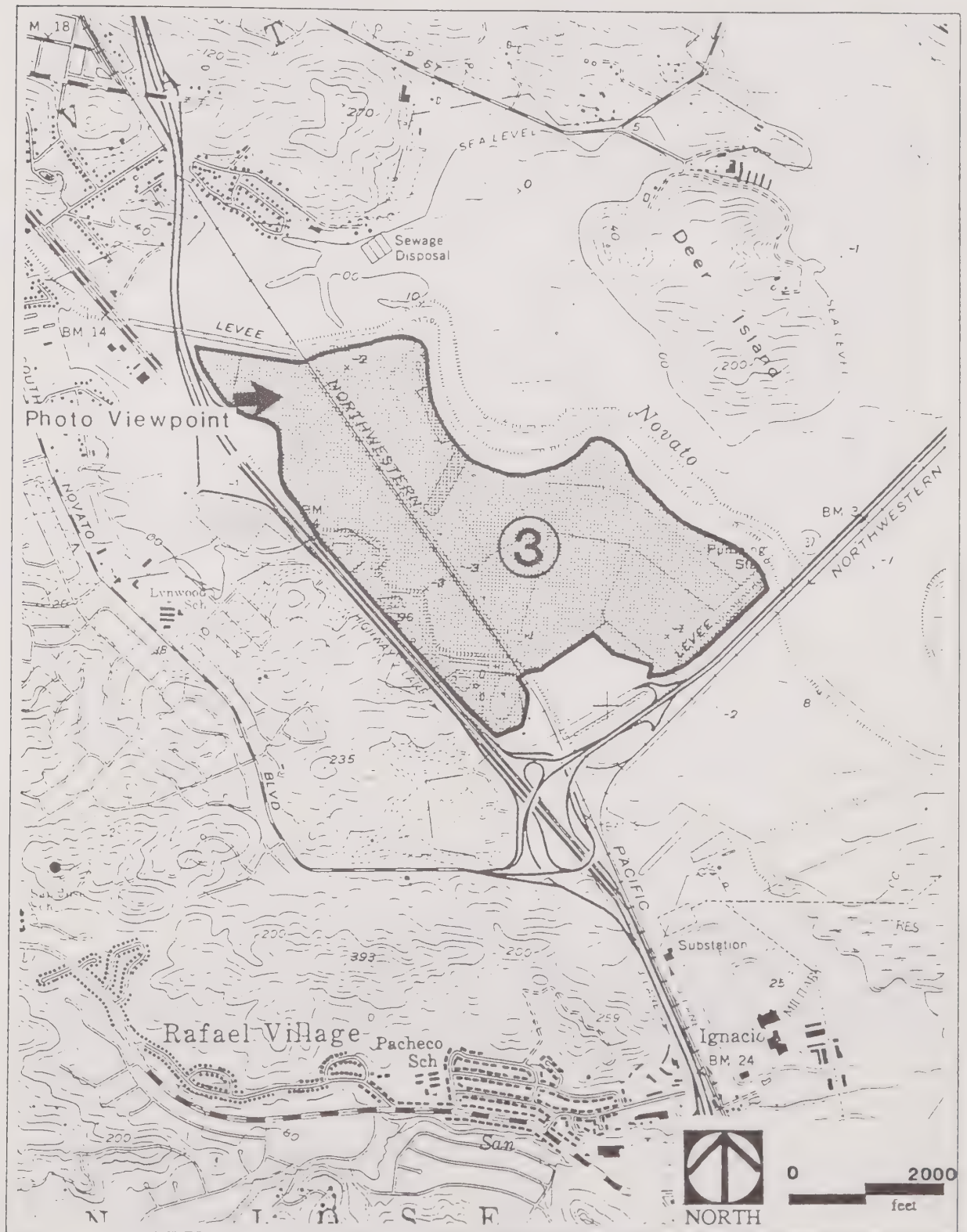
**ADJACENT USES:** Undeveloped land to the east, residential development to the north.

**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Land use designations include conservation, commercial, office-industrial, and residential. Zoning is C-P, planned commercial and A-60, agricultural, minimum 60 acres.

View from Highway 101 Looking East



## Alternative Location - Site 3





# Alternative Sites Evaluation Worksheet

## Site 4 - Pinheiro Ridge

**LOCATION:** In unincorporated Marin County, east of Highway 101, north of Atherton Avenue, south of Rush Creek, east of Northwestern Pacific Railroad tracks.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** APN 143-160-22 is 384 acres, owner is Edward and Priscilla Ghirardo; APN 143-160-16 is 2.3 acres, owner is North Marin County Water District; APN 143-160-23 is 9.8 acres, owner is David and Karen Kenyon; APN 143-150-13 is 58 acres, owner is Bahia Valley Memorial Park. Total available acreage is 454 acres.

**AVAILABILITY/STATUS:** Approximately 225 acres of land is unavailable for development because it is in a Marin County Conservation District.

**POTENTIAL ENVIRONMENTAL ISSUES:** Overall site topography is an east/west trending ridge, potential hillside/slope development constraints.

**EXISTING USES:** Undeveloped.

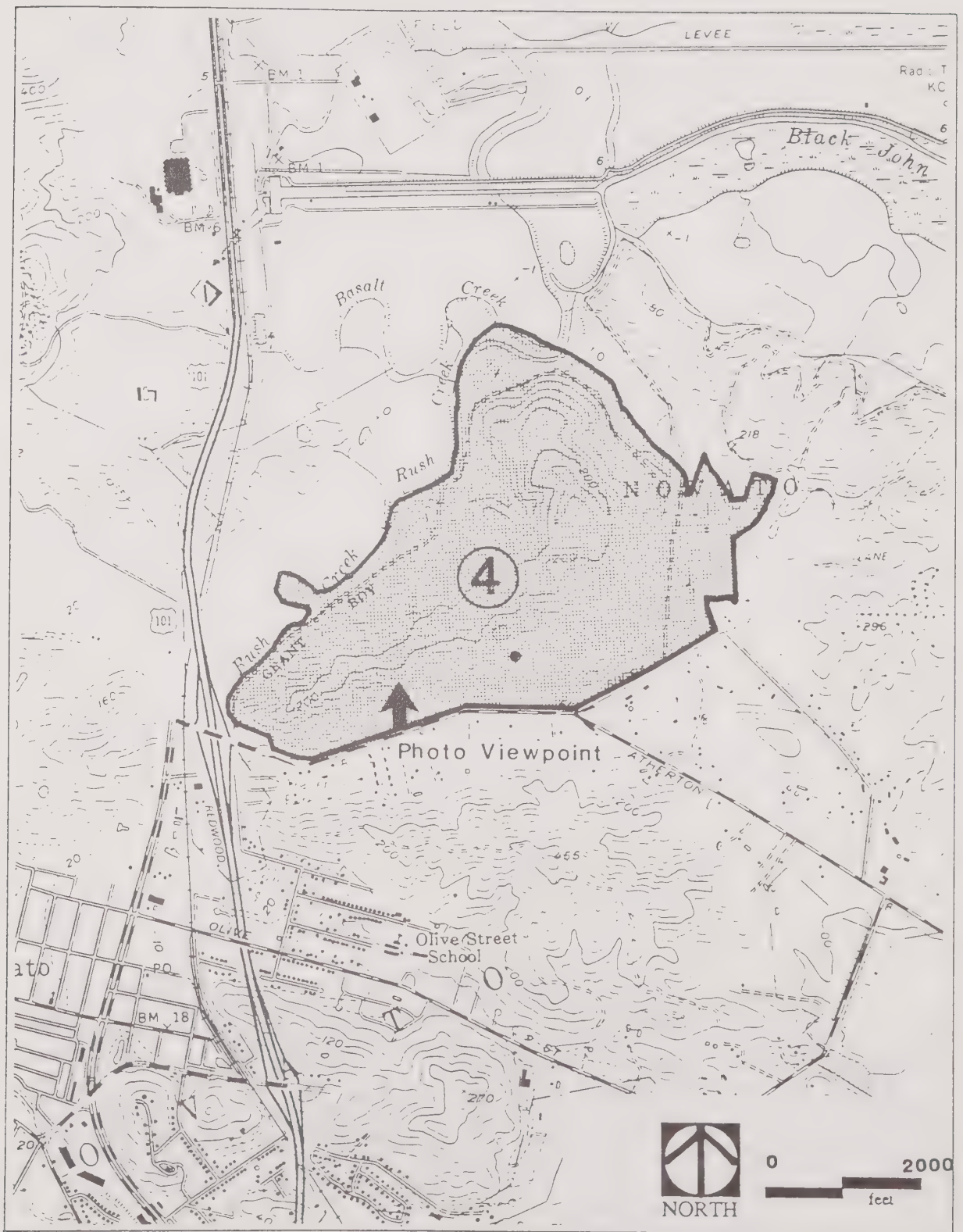
**ADJACENT USES:** Residential uses to the south, borders Rush Creek and associated wetland to the north.

**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Marin Countywide Plan designates low density residential development and urban open space. Zoning is R.M.P, low density residential, multiple, planned.

View from Atherton Avenue Looking North



## Alternative Location - Site 4





# Alternative Sites Evaluation Worksheet

## Site 5 - Burdell Mountain

**LOCATION:** In unincorporated Marin County, west of Highway 101 approximately two miles north of San Marin Drive. Abuts south side of Olompali State Park. West of Northwestern Pacific Railroad tracks.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** APN 125-180-61 is 82 acres, APN 125-180-62 is 234 acres, and APN 125-180-63 is 172 acres. All parcels are under joint ownership by Mount Burdell Enterprises and Mount Burdell Partners, Ltd. Total acreage of site is 488 acres.

**AVAILABILITY/STATUS:** Approximately 406 acres of the site is unavailable because it is within an Inland Rural Corridor as designated in the Marin Countywide Plan.

**POTENTIAL ENVIRONMENTAL ISSUES:** The site is steep and hilly, potential erosion and grading impacts. Close proximity to the Burdell Mountain fault.

**EXISTING USES:** Undeveloped

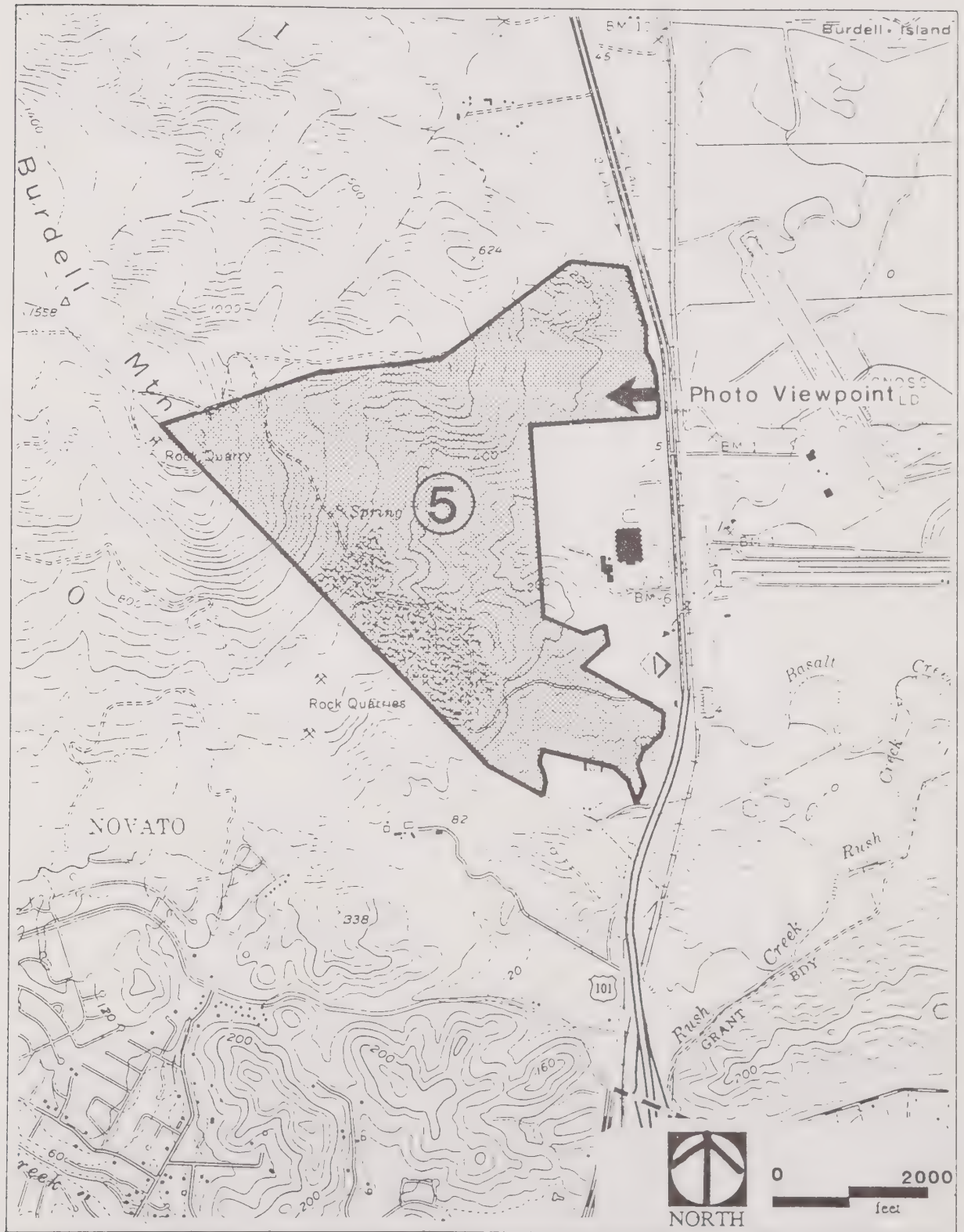
**ADJACENT USES:** State Park lands (Olompali State Park), commercial businesses along Redwood Boulevard (McGraw-Hill Publishing Company and Firemen's Insurance Fund), Gness Field (Marin County Airport).

**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Burdell Mountain identified as open space within the Novato Planning Area of the Marin Countywide Plan. County zoning designation for north and western portions is A-60, agricultural, minimum 60 acres. Zoning for portion abutting Highway 101 is M-3, planned industrial district.

View from Redwood Blvd. Looking West



## Alternative Location - Site 5



# Alternative Sites Evaluation Worksheet

## Site 6 - Olompali East

**LOCATION:** In unincorporated Marin County, east of Highway 101, west of Northwestern Pacific Railroad tracks, south of San Antonio Road.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** APN 125-160-17 is 64 acres, APN 125-160-18 is 393 acres, APN 125-160-19 is 22 acres. All parcels owned by Mary Silveira. Total acreage is 479 acres.

**AVAILABILITY/STATUS:** 394 acres are unavailable because they are under Williamson Act contracts.

**POTENTIAL ENVIRONMENTAL ISSUES:** Loss of prime agricultural land.

**EXISTING USES:** Undeveloped, grazed, mining operation.

**ADJACENT USES:** Redwood Landfill to the east, agricultural land to the west, Sonoma County boundary to the north.

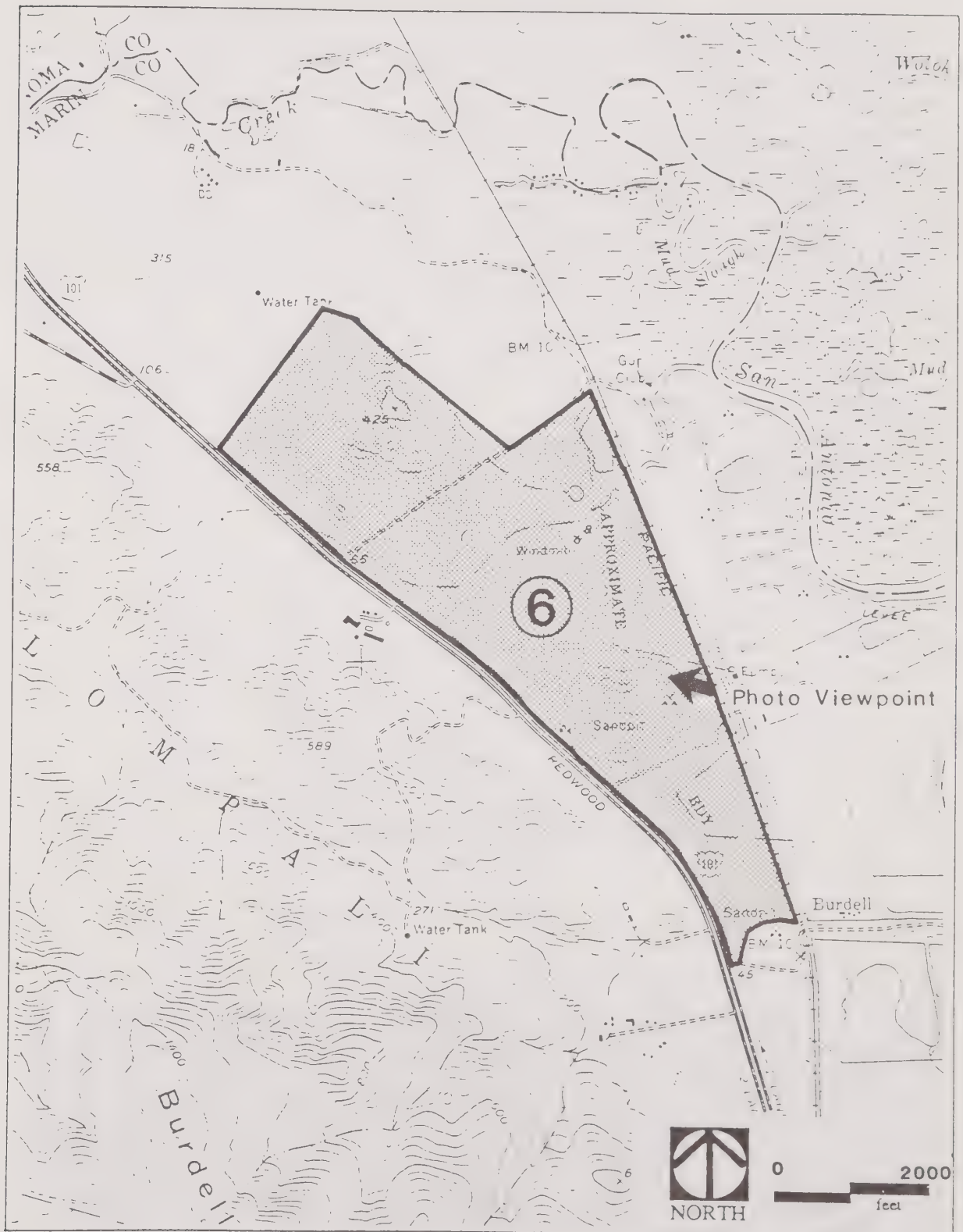
**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Agricultural open space land use designation, Zoning A-60, minimum parcel size is 60 acres.

View from Railroad Tracks Looking Northwest





## Alternative Location - Site 6



# Alternative Sites Evaluation Worksheet

## Site 7 - Stony Point Road

**LOCATION:** In unincorporated Sonoma County. Site bounded by West Railroad Avenue and Jewett Avenue to the northwest, Pepper Road to the south and Highway 101 to the east.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** Eleven parcels in various ownerships totalling about 455 acres.

**AVAILABILITY/STATUS:** The entire site is unavailable due to its designation as a Sonoma County Community Separator. Approximately 160 acres unavailable due to agricultural preserve status.

**POTENTIAL ENVIRONMENTAL ISSUES:** Loss of prime agricultural land.

**EXISTING USES:** Agriculture, open space, residences.

**ADJACENT USES:** Residences about western, central portion of site. Recreational and agricultural.

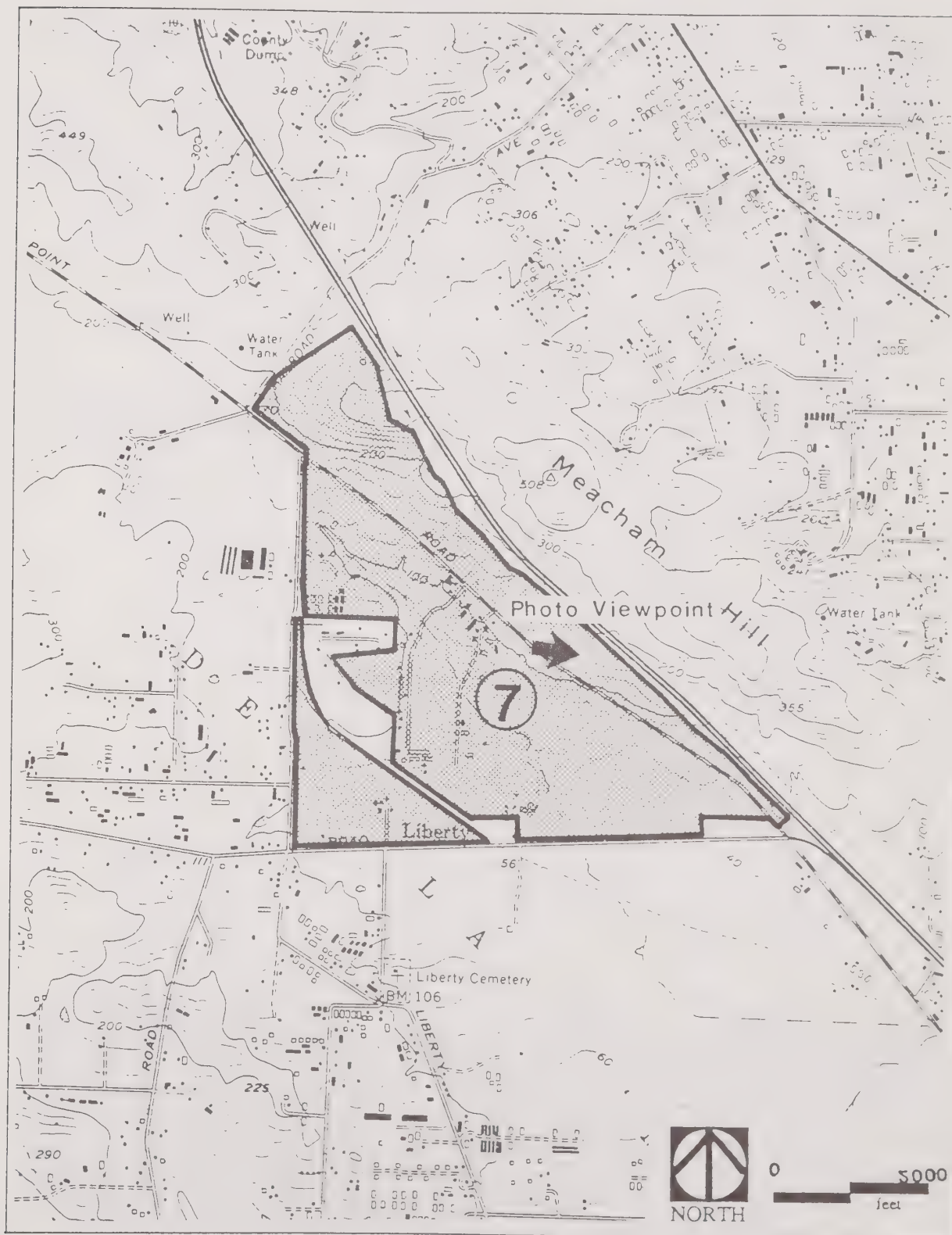
**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Site is designated for rural residential uses (one to five units per acre). Zoning is various agricultural districts.

View from Stony Point Road Looking Southwest





## Alternative Location - Site 7



# Alternative Sites Evaluation Worksheet

## Site 8 - Lakeville Road East

**LOCATION:** In unincorporated Sonoma County, east of Lakeville Road, north of Highway 37.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** 19 parcels in various ownerships totalling about 483 acres.

**AVAILABILITY/STATUS:** Entire site is designated as a Scenic Landscape Unit in Sonoma County and is not available for development.

**POTENTIAL ENVIRONMENTAL ISSUES:** Loss of prime agricultural land, potential flooding problems.

**EXISTING USES:** Grazing, undeveloped.

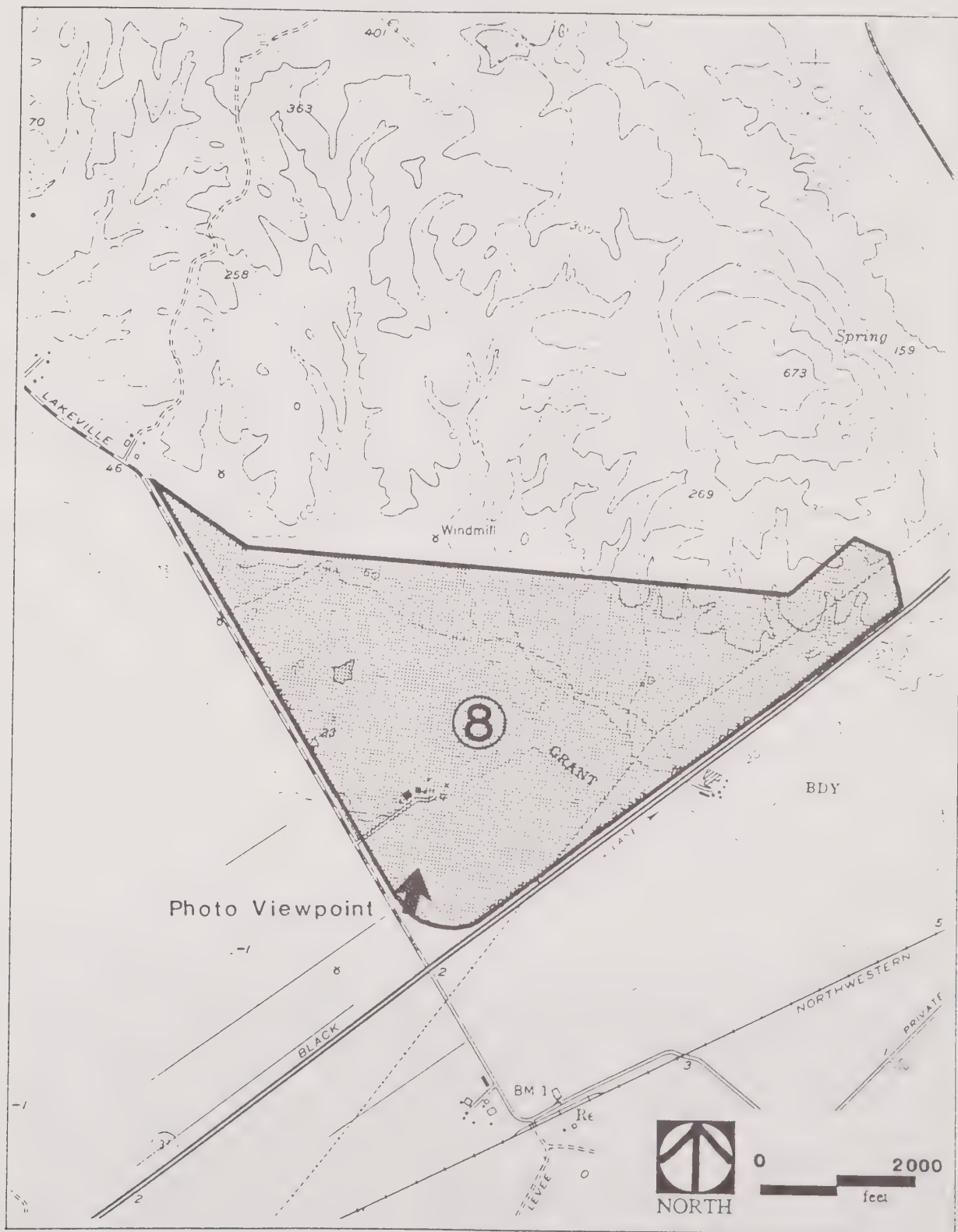
**ADJACENT USES:** Agricultural and open space.

**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Land use designation grazing, forage crops, and livestock. Zoning A1-B6, primary agriculture with a maximum of one dwelling unit per acre.

View from Lakeville Highway Looking Northeast



## Alternative Location - Site 8





# Alternative Sites Evaluation Worksheet

## Site 9 - Lakeville Road West

**LOCATION:** In unincorporated Sonoma County, west of Lakeville Road, north of Highway 37.

**ASSESSOR PARCEL NUMBER/PARCEL SIZE/OWNERSHIP:** APN 68-150-10 is 238 acres, owner is North Point Joint Venture; APN 68-130-09 is 247 acres, owner is Sonoma Bay Land Ltd. Total acreage is 485 acres.

**AVAILABILITY/STATUS:**

**POTENTIAL ENVIRONMENTAL ISSUES:** Potential flooding impacts, loss of agricultural land and open space.

**EXISTING USES:** Undeveloped, grazing, floodplain, residential.

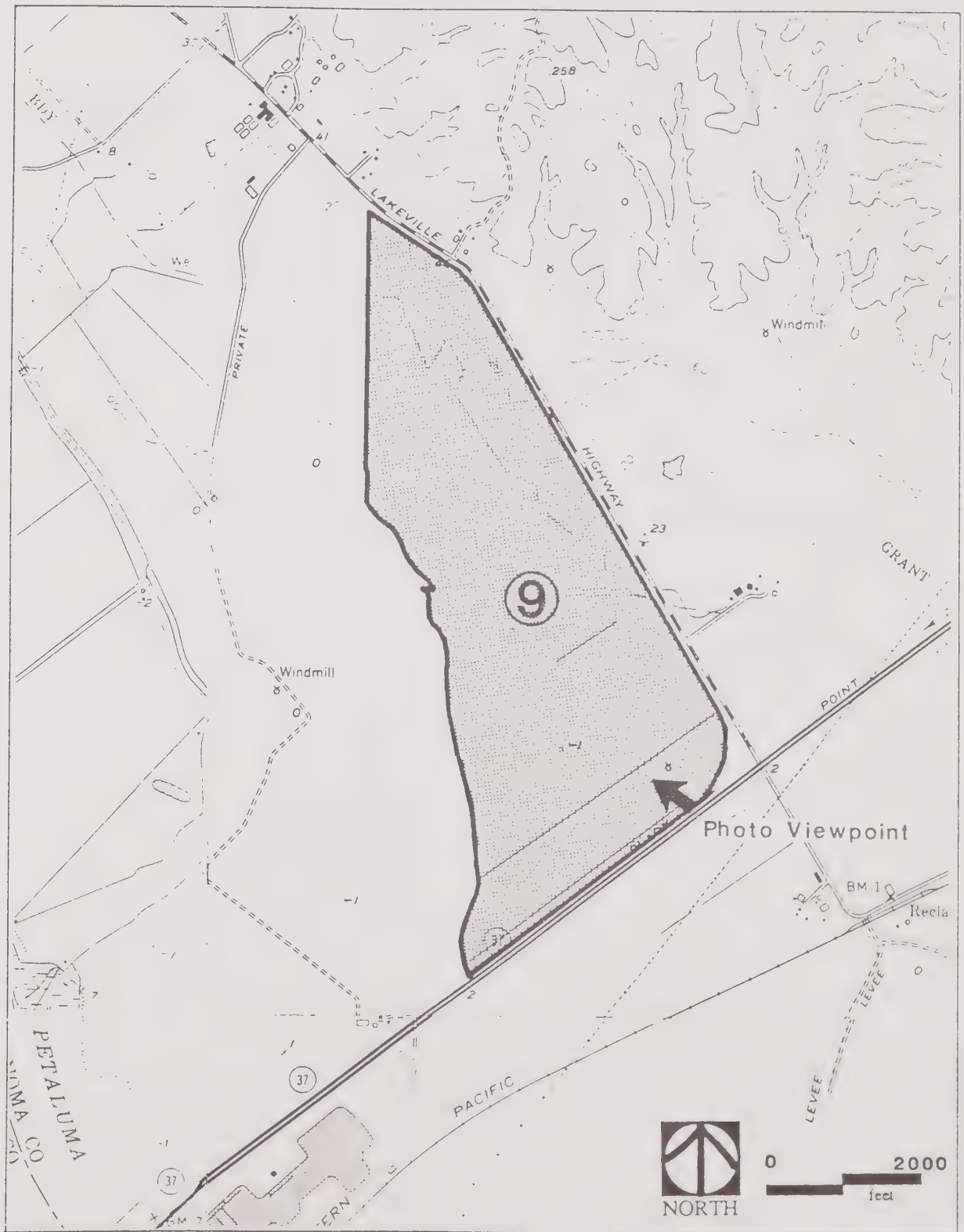
**ADJACENT USES:** Undeveloped, agricultural, residential, grazing.

**GENERAL PLAN LAND USE/ZONING DESIGNATIONS:** Land use designation is grazing, forage crops, and livestock. Zoning A1-B6-F2, primary agriculture with a minimum density of 60 and 100 acres in a secondary flood plain combining district.

View from Highway 37 Looking Northwest



## Alternative Location - Site 9





APPENDIX D  
PACHECO CREEK REALIGNMENTS AND  
SITE PLANNING RELATIONSHIPS

March 11, 1988

RECEIVED

MAR 14 REC'D

LSA

Mr. Ric Villaseñor  
Senior Biologist  
EIP Associates  
150 Spear Street, Suite 1500  
San Francisco, CA 94105

Re: Pacheco Creek Realignments & Site Planning Relationships

Dear Mr. Villaseñor:

At the request of Mr. Paul Sevy, I am forwarding an overview of the site planning constraints and decisions leading up to the relocation of Pacheco Creek.

In our original site design review, it became clear that a new entry road north of State Access Road (serving the Hamilton Field property) would be necessary to provide adequate and safe access to any project contemplated at Hamilton Field. The need for a new entry road was required because of the following:

- . Both existing State Access Road and Main Gate Road which serve the Hamilton site are bounded by existing military buildings, military housing, Lanham Village, and the Hamilton Elementary School. At the present time, the existing uses and parcels are not owned by the project sponsor. All the adjoining uses are located immediately adjacent to or within 10 feet of State Access Road and Main Gate thereby limiting both relocation and expansion opportunities.
- . Both existing State Access Road and Main Gate Road do not meet standard City of Novato roadway designs. In short, they are substandard in design and would require expansion in width to meet acceptable public safety criteria.
- . The project sponsor in its contract for purchase of the re-use portion of Hamilton Field is obligated to maintain existing street access for military buildings, and military housing. We are also physically limited in alternate street design flexibility for the access points into the Lanham Housing Village because of its internal circulation pattern.
- . The 1984 Land Use Plan adopted by the City of Novato City Council as a guideline for development at Hamilton Field recognized the above constraints and proposed that a third access to Hamilton Field be provided.

Mr. Ric Villaseñor  
March 11, 1988  
Page 2

With the above constrained right-of-way for State Access and Main Gate which also significantly reduce road capacities, site planning identified a general alignment for the new northerly entry roadway that would meet City of Novato design standards and would traverse property to be owned by the project sponsor only. A more specific alignment was then identified which avoided the existing military holding called "the commissary triangle" and allowed for adequate community planning distance between State Access Road and the new main entry.

The final location of the new main entry road which met the City of Novato design criteria (e.g. design speed, curvature of turns, width, etc.) and avoided parcels not owned by the project sponsor necessitated encroachment into a seasonal wetland habitat area. The seasonal wetland area is under Army Corps of Engineers Sec. 404 jurisdiction. The seasonal wetland area is fed by the Pacheco Creek in its present alignment.

The next site design issue impacting the alignment of the new main entry roadway was its intersection with the NWPRR right-of-way. Early in determining site design criteria for the Hamilton Field Master Plan, it was also clear that the NWPRR right-of-way would have to be retained. The site design incorporated the NWPRR for the following reasons.

- . The multi-jurisdictional 101 Corridor Committee studying sub-regional transit needs has identified the NWPRR as a public transit resource. The NWPRR is currently being studied as a regional transit corridor accommodating either light rail or HOV modes of travel.
- . Proposed light rail and HOV services to differing degrees would interrupt and conflict with traffic using the new main entry road and State Access Road which both intersect with NWPRR right-of way at grade.
- . The volume of vehicles utilizing the NWPRR right-of-way was estimated to be either a bus per every 3-10 minutes during peak hours for HOV service or a train every 10-20 minutes during peak hours. A decision as to which is the preferred public transit is far from being selected precluding more definitive design options. We have proceeded on the basis that Hamilton Field's community design could not limit transit options at this time. Therefore, it is clear to us that a separation of crossings was necessary.
- . In 1987, the U.S. Congress appropriated federal funding for the purchase of the NWPRR from the present owners to be available for public transit. The purchase is presently under negotiation.

. A transit center was incorporated in the community retail center in compliance with the City of Novato community policy to "maximize impacts of the journey to work" for Hamilton Field.

Given the stature of NWPRR as a sub-regional transportation resource, and the traffic conflicts with the existing State Access Road and the proposed new main entry roadway intersections it was also clear that the NWPRR would have to be grade separated by either depressing the NWPRR right-of-way or constructing elevated bridge crossings. Our review of those options noted the following:

. Earth ramp slopes for elevated bridge crossings at either the new main entry of State Access Road would require closing of existing entranceways into military buildings which we are precluded from proposing.

. Earth ramp and structured ramp slopes for elevated bridge crossings would require additional encroachment into the adjacent seasonal wetlands area north of the new main entry alignment.

. Closure of access points to military buildings would still be necessary if a structured ramps was used instead of earth ramps due to the length of ramp needed to reach bridge maximum elevation at both the new main entry and State Access Road intersections.

. The elevated bridge crossing will necessitate the raising of existing PG&E major transmission lines and possibly the relocation of transmission towers. The transmission towers and associated easement generally parallels the easterly NWPRR right-of-way. It is unknown at this time whether the transmission lines could be raised adequately to allow for a bridge crossing. It is unknown, also, if the relocation of towers is possible given the close location of the area substation near the Main Gate Road/NWPRR intersection.

. Moving the new main entry road southward and adopting a separated bridge crossing to totally avoid seasonal wetland fill while technically possible can only be accomplished by incorporating a substandard roadway alignment, including non-standard radius curves, and designing an oblique angled bridge alignment with questionable public safety and increased public liability risks.

. An elevated bridge crossing with the wetlands fill at the new main entry would still encroach into seasonal wetlands because of foundation pile requirements added length and width for HOV lanes and introducing day long shading to a portion of the habitat.

- . Not depressing the NWPRR will have other related community impacts such as the introduction of significant noise and air pollution to both business and residential neighborhoods. Also the NWPRR if not depressed acts as a barrier between major areas of the project as well as introduce an attractive nuisance with its attendant public safety liability risks.
- . Elevated bridge crossing will introduce structures that in our judgment will have a negative visual impact.

Depressing the NWPRR right-of-way compares to elevated bridge crossings in the following manner.

- . A depressed NWPRR right-of-way will not require ramp construction thereby avoiding conflicts with existing military access rights, avoid potential in-fill on properties not owned by the project sponsor, avoid relocation of transmission lines and towers.
- . From a community design perspective a depressed NWPRR right-of-way will introduce less significant noise pollution into the community, not create the extent of a visual barrier between community uses than a surface location and act less as an attractive nuisance.
- . In this instance, depressing the right-of-way is a less costly alternative than construction of elevated bridge crossings. The additional cost to the project of elevated bridge crossings has been estimated by the project's consulting civil engineer at approximately \$2 million dollars.

Based on the above, Hamilton Field incorporated a depressed NWPRR in its proposed community design.

The site planning decision to depress the NWPRR right-of-way brought into focus another related site feature. The Pacheco Creek waterway currently crosses the site near the southerly intersection of "C" Street and Main Gate Road. The creek then travels underground through the Lanham Village/Base Exchange area. Then, near the Commissary Triangle and just before reaching the NWPRR right-of-way, Pacheco Creek is contained in an open concrete channel. The existing open air concrete channel then traverses the site in an arch until it reaches the season wetlands area which are the subject of Army Corps of Engineers Section 404 jurisdiction. Review of the Pacheco Creek concrete channel section by the consulting civil engineer revealed the following:

- . The existing 10'-15' wide and 8'-10' deep concrete channel is fully lined (e.g. including bottom).
- . The existing concrete channel does not meet current City of Novato or Marin County Flood Control design standards in size or construction.



- . The existing concrete channel has received limited or very irregular maintenance as shown by the occasional cracking of surfaces which have not been repaired and the presence of significant vegetative growth covering the bottom area.
- . If the channel were replaced and sized to meet City of Novato standards, the resulting dimensions would be 40'-60' across and 10-15 feet in depth.
- . Regular maintenance as performed by the City of Novato and Marin County Flood Control District would limit the extent of vegetation well below that exhibited by the existing concrete channel.
- . Army Corps of Engineers did not assert Sec. 404 jurisdiction for the concrete lined portion of Pacheco Creek.
- . The depressed NWPRR right-of-way will require a relocation of the Pacheco Creek crossing or construction of a specialized structure acting as a siphon for passing water under the depressed NWPRR right-of-way. A siphon concrete feature will not be acceptable to Marin County Flood Control District nor has the District accepted a structure in recent years based on higher maintenance cost and difficult maintenance issues, according to Flood Control staff. Therefore, we pursued a crossing where water flows could be retained at or near natural grade. The depressed NWPRR right-of-way will be brought up to its original grade (e.g. at surface) as it nears the northerly project boundary. Therefore, the Pacheco Creek crossing if relocated to a point north of its current crossing would not have to be siphoned under the NWPRR right-of-way. The new proposed alignment of Pacheco Creek as proposed by the Hamilton Field Master Plan was to parallel the NWPRR right-of-way. Since relocation was necessary due to the depressed NWPRR right-of-way, the only site planning decision remaining was whether to convey the Pacheco Creek waters in an open air concrete lined riprapped channel or in an underground pipe as currently provided through one-half its course through the site. We have previously noted that the existing channel would be required to be replaced by a much larger facility because of its substandard design. The open air concrete lined channel posed the following issues:
  - . Its 40 to 60 foot width, additional 15 feet service road and necessary fencing would add a physical barrier in close proximity to the already incorporated depressed NWPRR right-of-way.
  - . Almost parallel physical barriers would create a severely constrained (or a site planning) "no mans" land between the open air channel and NWPRR right-of-way.
  - . The open air channel would add another attractive nuisance and add to the public safety liability already nearby with the NWPRR.

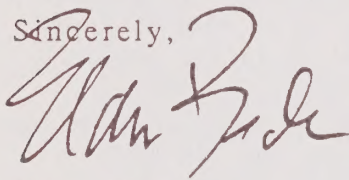
Mr. Ric Villasenor  
March 11, 1988  
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- . The open air channel would be located near the highest pedestrian and vehicular traffic area in the project (i.e. the retail center), compounding the potential liability risks.
- . The Pacheco Creek does not flow year-round in the Hamilton Field segment.
- . A concrete or riprapped channel would offer habitat serving limited diversity species and would not add any scenic value to the project.
- . The underground piping does have a significant higher cost than an open concrete lined channel but the construction cost is completely offset by the utility of land available by undergrounding the water flows.

Therefore, with the above in mind, our project design incorporates an underground piping proposal for the Pacheco Creek waters matching the existing treatment in the Exchange/Lanham Village area.

If you have any additional questions regarding the above rationale or design decisions made by the project team, please don't hesitate to contact me.

Sincerely,



Eldon Beck

clg:57

cc: Jim Revoir  
Paul Sevy  
Malcolm Sproul  
Ted Adams  
Stuart Eurman  
Mark Westfall  
John Stuber

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